**Chapter 13 Fire Protection Systems**

13.1 General

13.1.1

The AHJ shall have the authority to require that construction documents for all fire protection systems be submitted for review and approval and a permit be issued prior to the installation, rehabilitation, or modification. (For additional information concerning construction documents, see Section 1.14.) Further, the AHJ shall have the authority to require that full acceptance tests of the systems be performed in the AHJ's presence prior to final system certification.

13.1.1.1 Permits

Permits, where required, shall comply with Section 1.12.

13.1.2

The property owner shall be responsible for the proper testing and maintenance of the equipment and systems.

13.1.3 Integrated Fire Protection and Life Safety System Test

13.1.3.1 Basic Testing

Where required by Chapters 11 through 43 of NFPA 101, installations involving two or more integrated fire protection or life safety systems shall be tested to verify the proper operation and function of such systems in accordance with 13.1.3.1.1 and 13.1.3.1.2. [101:9.11.4.1]

13.1.3.1.1

When a fire protection or life safety system is tested, the response of integrated fire protection and life safety systems shall be verified. [101:9.11.4.1.1]

13.1.3.1.2

After repair or replacement of equipment, required retesting of integrated systems shall be limited to verifying the response of fire protection or life safety functions initiated by repaired or replaced equipment. [101:9.11.4.1.2]

13.1.3.2\* NFPA 4 Testing

Where required by 9.3.5 or Chapters 11 through 43 of NFPA 101, the following integrated fire protection and life safety systems shall be tested in accordance with 13.1.3.1 and 13.1.3.2.1 through 13.1.3.2.2:

Integrated fire protection and life safety systems in high-rise buildings

Integrated fire protection and life safety systems that include a smoke control system

[101:9.11.4.2]

13.1.3.2.1

For new buildings, integrated testing in accordance with NFPA 4 shall be conducted prior to the issuance of a certificate of occupancy. [101:9.11.4.2.1]

13.1.3.2.2

For existing buildings, integrated testing in accordance with NFPA 4 shall be conducted at intervals not exceeding 10 years unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. [101:9.11.4.2.2]

13.1.4

Obstructions shall not be placed or kept near fire hydrants, fire department inlet connections, or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately visible and accessible.

13.1.5

A minimum 36 in. (915 mm) of clear space shall be maintained to permit access to and operation of fire protection equipment, fire department inlet connections, or fire protection system control valves. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment.

13.1.5.1

An approved clear and unobstructed path shall be provided and maintained for access to the fire department inlet connections.

13.1.6

Detailed records documenting all systems and equipment testing and maintenance shall be kept by the property owner and shall be made available upon request for review by the AHJ.

13.1.7

Existing systems shall be in accordance with 1.3.6.2 and 10.3.2.

13.1.8

All fire protection systems and devices shall be maintained in a reliable operating condition and shall be replaced or repaired where defective or recalled.

13.1.9

Whenever impairments, critical deficiencies, or noncritical deficiencies are identified in water-based fire protection systems maintained in accordance with NFPA 25, they shall be corrected in a time frame approved by the AHJ.

13.1.10

The AHJ shall be notified when any fire protection system is out of service and on restoration of service.

13.1.11

In the event of a failure of a fire protection system or an excessive number of accidental activations, the AHJ shall be permitted to require an approved fire watch until the system is repaired.

13.1.12\*

For occupancies of an especially hazardous nature or where special hazards exist in addition to the normal hazard of the occupancy, or where access for fire apparatus is unduly difficult, or where the size or configuration of the building or contents limits normal fire suppression efforts, the AHJ shall have the authority to require additional safeguards consisting of additional fire safety equipment, more than one type of fire safety equipment, or special systems suitable for the protection of the hazard involved.

13.1.13

The AHJ shall have the authority to require locking fire department connection (FDC) plugs or caps on all water-based fire protection systems.

13.2 Standpipe Systems

13.2.1 General

13.2.1.1

The design and installation of standpipe systems shall be in accordance with Section 13.2 and NFPA 14.

13.2.1.2

Where standpipe and hose systems are installed in combination with automatic sprinkler systems, installation shall be in accordance with the appropriate provisions established by NFPA 13 and NFPA 14. [101:9.10.2]

13.2.2 Where Required

13.2.2.1

Where required by this Code or the referenced codes and standards listed in Chapter 2, standpipe systems shall be installed in accordance with 13.2.1.

13.2.2.2

New buildings shall be equipped with a Class I standpipe system installed in accordance with the provisions of Section 13.2 where any of the following conditions exist:

Four or more stories in height above grade plane where the building is protected by an approved automatic sprinkler system

Three or more stories in height above grade plane where the building is not protected by an approved automatic sprinkler system

\* More than 50 ft (15 m) above grade plane and containing intermediate stories or balconies

More than one story below grade plane

More than 20 ft (6.1 m) below grade plane

13.2.2.3

High-rise buildings shall be protected throughout by a Class I standpipe system in accordance with Section 13.2. [101:11.8.3.2]

13.2.2.4 New and Existing Detention and Correctional Facilities

Standpipe and hose systems shall be provided in accordance with Section 9.10 of NFPA 101 as follows, unless otherwise permitted by 13.2.2.4.1:

Class I standpipe systems shall be provided for any building three or more stories in height.

Class III standpipe and hose systems shall be provided for all nonsprinklered buildings three or more stories in height.

[101:22.3.5.5; 101:23.3.5.5]

13.2.2.4.1

The requirements of 13.2.2.4 shall not apply where otherwise permitted by the following:

Formed hose, 1 in. (25 mm) in diameter, on hose reels shall be permitted to provide Class II service.

Separate Class I and Class II systems shall be permitted in lieu of a Class III system.

[101:22.3.5.6; 101:23.3.5.6]

13.2.2.5\*

The AHJ shall be authorized to permit the removal of existing occupant-use hose lines where all of the following are met:

This Code does not require their installation.

The current building code does not require their installation.

The AHJ determines that the occupant-use hose line will not be utilized by trained personnel or the fire department.

13.2.3 Inspection, Testing, and Maintenance

13.2.3.1

A standpipe system installed in accordance with this Code shall be properly maintained to provide at least the same level of performance and protection as designed.

13.2.3.2

The owner shall be responsible for maintaining the standpipe system and keeping it in good working condition.

13.2.3.3

A standpipe system installed in accordance with this Code shall be inspected, tested, and maintained in accordance with NFPA 25.

13.2.3.4 Existing Systems

13.2.3.4.1

Where an existing standpipe system, including yard piping and fire department connection, is modified, the new piping shall be independently tested in accordance with 11.4.1 of NFPA 14. [14:11.4.7.1]

13.2.3.4.2

Modifications that cannot be isolated, such as new valves or the point of connection for new piping, shall not require testing in excess of system static pressure. [14:11.4.7.2]

13.3 Automatic Sprinklers

13.3.1 General

13.3.1.1\*

Automatic sprinklers shall be installed and maintained in full operating condition in the occupancies specified in this Code or in the codes or standards referenced in Chapter 2.

13.3.1.2

Installations shall be in accordance with NFPA 13, NFPA 13R, or NFPA 13D as appropriate.

13.3.1.3

Existing systems shall be in accordance with 1.3.6.2 and 10.3.2.

13.3.1.4

Sprinkler piping serving not more than six sprinklers for any hazardous area shall be permitted to be connected directly to a domestic water supply system having a capacity sufficient to provide 0.15 gpm/ft2 (6.1 mm/min) throughout the entire enclosed area. [101:9.7.1.2]

13.3.1.5

Sprinkler piping serving hazardous areas as described in 13.3.1.4 shall be provided with an indicating shutoff valve, supervised in accordance with 13.3.1.8 or NFPA 13, and installed in an accessible, visible location between the sprinklers and the connection to the domestic water supply. [101:9.7.1.3]

13.3.1.6\*

In areas protected by automatic sprinklers, automatic heat-detection devices required by other sections of this Code shall not be required. [101:9.7.1.4]

13.3.1.7

Automatic sprinkler systems installed to make use of an alternative permitted by this Code shall be considered required systems and shall meet the provisions of this Code that apply to required systems. [101:9.7.1.5]

13.3.1.8 Supervision

13.3.1.8.1 Supervisory Signals

13.3.1.8.1.1

Where supervised automatic sprinkler systems are required by another section of this Code, supervisory attachments shall be installed and monitored for integrity in accordance with NFPA 72 and a distinctive supervisory signal shall be provided to indicate a condition that would impair the satisfactory operation of the sprinkler system. [101:9.7.2.1.1]

13.3.1.8.1.2

Supervisory signals shall sound and shall be displayed either at a location within the protected building that is constantly attended by qualified personnel or at an approved, remotely located receiving facility. [101:9.7.2.1.2]

13.3.1.8.2 Alarm Signal Transmission

13.3.1.8.2.1

Where supervision of automatic sprinkler systems is required by another section of this Code, waterflow alarms shall be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station, or the fire department. [101:9.7.2.2.1]

13.3.1.8.2.2

The connection described in 13.3.1.8.2.1 shall be in accordance with 13.7.1.1. [101:9.7.2.2.2]

13.3.2 Where Required

13.3.2.1

Where required by this Code or the referenced codes and standards listed in Chapter 2, automatic sprinkler systems shall be installed in accordance with 13.3.1.

13.3.2.2

Basements exceeding 2500 ft2 (232 m2) in new buildings shall be protected throughout by an approved automatic sprinkler system.

13.3.2.3

New buildings housing emergency fire, rescue, or ambulance services shall be protected throughout by approved supervised automatic sprinkler systems.

13.3.2.4

New buildings three or more stories in height above grade shall be protected throughout by an approved automatic sprinkler system in accordance with Section 13.3 unless otherwise permitted by 13.3.2.5.

13.3.2.5

Stand-alone open parking structures that are detached from other occupancies shall not be required to be protected by an automatic sprinkler system.

13.3.2.6 New Assembly Occupancies

13.3.2.6.1

The following assembly occupancies shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.1.2:

Dance halls

Discotheques

Nightclubs

Assembly occupancies with festival seating

[101:12.3.5.1]

13.3.2.6.2

Any building containing one or more assembly occupancies where the aggregate occupant load of the assembly occupancies exceeds 300 shall be protected by an approved, supervised automatic sprinkler system in accordance with NFPA 13 as follows (see also 12.1.6, 12.2.6, 12.3.2, and 12.3.6 of NFPA 101):

Throughout the story containing the assembly occupancy

Throughout all stories below the story containing the assembly occupancy

In the case of an assembly occupancy located below the level of exit discharge, throughout all stories intervening between that story and the level of exit discharge, including the level of exit discharge

[101:12.3.5.2]

13.3.2.6.3

The requirements of 13.3.2.6.2 shall not apply to the following:

\* Assembly occupancies consisting of a single multipurpose room of less than 12,000 ft2 (1115 m2) that are not used for exhibition or display and are not part of a mixed occupancy

Gymnasiums, skating rinks, and swimming pools used exclusively for participant sports with no audience facilities for more than 300 persons

\* Locations in stadia and arenas as follows:

Over the floor areas used for contest, performance, or entertainment, provided that the roof construction is more than 50 ft (15 m) above the floor level, and use is restricted to low fire hazard uses

Over the seating areas, provided that use is restricted to low fire hazard uses

Over open-air concourses where an approved engineering analysis substantiates the ineffectiveness of the sprinkler protection due to building height and combustible loading

Locations in unenclosed stadia and arenas as follows:

Press boxes of less than 1000 ft2 (93 m2)

Storage facilities of less than 1000 ft2 (93 m2) if enclosed with not less than 1-hour fire-resistance-rated construction

Enclosed areas underneath grandstands that comply with 25.3.4

[101:12.3.5.3]

13.3.2.6.4

Diagram

Where another provision of Chapter 12 of NFPA 101 requires an automatic sprinkler system, the sprinkler system shall be installed in accordance with NFPA 13. [101:12.3.5.4]

Upcodes Diagrams

13.3.2.6.5 Fire Protection

Every stage shall be protected by an approved, supervised automatic sprinkler system in compliance with Section 13.3. [101:12.4.7.10]

13.3.2.6.5.1

Protection shall be provided throughout the stage and in storerooms, workshops, permanent dressing rooms, and other accessory spaces contiguous to stages. [101:12.4.7.10.1]

13.3.2.6.5.2

Sprinklers shall not be required for stages 1000 ft2 (93 m2) or less in area and 50 ft (15 m) or less in height where the following criteria are met:

Curtains, scenery, or other combustible hangings are not retractable vertically.

Combustible hangings are limited to borders, legs, a single main curtain, and a single backdrop.

[101:12.4.7.10.2]

13.3.2.6.5.3

Sprinklers shall not be required under stage areas less than 48 in. (1220 mm) in clear height that are used exclusively for chair or table storage and lined on the inside with 5/8 in. (16 mm) Type X gypsum wallboard or the approved equivalent. [101:12.4.7.10.3]

13.3.2.7 Existing Assembly Occupancies

13.3.2.7.1

Where the occupant load exceeds 100, the following assembly occupancies shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3:

Dance halls

Discotheques

Nightclubs

Assembly occupancies with festival seating

[101:13.3.5.1]

Upcodes Diagrams

13.3.2.7.2

Any assembly occupancy used or capable of being used for exhibition or display purposes shall be protected throughout by an approved automatic sprinkler system in accordance with Section 13.3 where the exhibition or display area exceeds 15,000 ft2 (1400 m2). [101:13.3.5.2]

13.3.2.7.3

The sprinklers specified by 13.3.2.7.2 shall not be required where otherwise permitted in the following locations:

Locations in stadia and arenas as follows:

Over the floor areas used for contest, performance, or entertainment

Over the seating areas

Over open-air concourses where an approved engineering analysis substantiates the ineffectiveness of the sprinkler protection due to building height and combustible loading

Locations in unenclosed stadia and arenas as follows:

Press boxes of less than 1000 ft2 (93 m2)

Storage facilities of less than 1000 ft2 (93 m2) if enclosed with not less than 1-hour fire-resistance-rated construction

Enclosed areas underneath grandstands that comply with 25.3.4

[101:13.3.5.3]

13.3.2.7.4

Where another provision of this chapter and Chapter 13 of NFPA 101 requires an automatic sprinkler system, the sprinkler system shall be installed in accordance with NFPA 13. [101:13.3.5.4]

13.3.2.7.5 Fire Protection

Every stage shall be protected by an approved automatic sprinkler system in compliance with Section 13.3. [101:13.4.7.10]

13.3.2.7.5.1

Protection shall be provided throughout the stage and in storerooms, workshops, permanent dressing rooms, and other accessory spaces contiguous to such stages. [101:13.4.7.10.1]

13.3.2.7.5.2

Sprinklers shall not be required for stages 1000 ft2 (93 m2) or less in area where the following criteria are met:

Curtains, scenery, or other combustible hangings are not retractable vertically.

Combustible hangings are limited to borders, legs, a single main curtain, and a single backdrop.

[101:13.4.7.10.2]

13.3.2.7.5.3

Sprinklers shall not be required under stage areas less than 48 in. (1220 mm) in clear height that are used exclusively for chair or table storage and lined on the inside with 5/8 in. (16 mm) Type X gypsum wallboard or the approved equivalent. [101:12.4.7.10.3]

13.3.2.8 New Educational Occupancies

13.3.2.8.1

Educational occupancy buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3 except as otherwise permitted by 13.3.2.8.2. [101:14.3.5.1]

13.3.2.8.2

The requirement of 13.3.2.8.1 shall not apply to any of the following:

Non-relocatable buildings having an area not exceeding 1000 ft2 (93 m2)

Non-relocatable buildings containing a single classroom

Relocatable buildings complying with all of the following:

Building area does not exceed 1000 ft2 (93 m2)

Building contains a single classroom

Building is located not less than 30 ft (9.1 m) from another building

[101:14.3.5.2]

13.3.2.8.3

Every portion of educational buildings below the level of exit discharge shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3. [101:14.3.5.3]

13.3.2.8.4

Buildings with unprotected openings in accordance with 8.6.6 of NFPA 101 shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3. [101:14.3.5.4]

13.3.2.8.5

Where another provision of Chapter 14 of NFPA 101 requires an automatic sprinkler system, the sprinkler system shall be installed in accordance with NFPA 13. [101:14.3.5.5]

13.3.2.9 Existing Educational Occupancies

Diagram

UpCodes Diagrams

P

Sprinklers: Group E (NFPA)

13.3.2.9.1

Where student occupancy exists below the level of exit discharge, every portion of such floor shall be protected throughout by an approved automatic sprinkler system in accordance with Section 13.3. [101:15.3.5.1]

13.3.2.9.2

Where student occupancy does not exist on floors below the level of exit discharge, such floors shall be separated from the rest of the building by 1-hour fire resistance-rated construction or shall be protected throughout by an approved automatic sprinkler system in accordance with Section 13.3. [101:15.3.5.2]

13.3.2.9.3

Automatic sprinkler protection shall not be required where student occupancy exists below the level of exit discharge, provided that both of the following criteria are met:

The approval of the AHJ shall be required.

Windows for rescue and ventilation shall be provided in accordance with 15.2.11.1 of NFPA 101.

[101:15.3.5.3]

13.3.2.9.4

Buildings with unprotected openings in accordance with 8.6.6 of NFPA 101 shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3. [101:15.3.5.4]

13.3.2.9.5

Where another provision of Chapter 15 of NFPA 101 requires an automatic sprinkler system, the sprinkler system shall be installed in accordance with Section 13.3. [101:15.3.5.5]

13.3.2.10 New Health Care Occupancies

13.3.2.10.1\*

Buildings containing health care occupancies shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3, unless otherwise permitted by 13.3.2.10.3. [101:18.3.5.1]

13.3.2.10.2

The sprinkler system required by 13.3.2.10.1 shall be installed in accordance with NFPA 13. [101:18.3.5.4]

13.3.2.10.3

In Type I and Type II construction, alternative protection measures shall be permitted to be substituted for sprinkler protection without causing a building to be classified as nonsprinklered, in specified areas where the AHJ has prohibited sprinklers. [101:18.3.5.5]

13.3.2.10.4\*

Listed quick-response or listed residential sprinklers shall be used throughout smoke compartments containing patient sleeping rooms. [101:18.3.5.6]

13.3.2.10.5\*

Sprinklers shall not be required in clothes closets of patient sleeping rooms in hospitals where the area of the closet does not exceed 6 ft2 (0.55 m2), provided that the distance from the sprinkler in the patient sleeping room to the back wall of the closet does not exceed the maximum distance permitted by NFPA 13. [101:18.3.5.10]

13.3.2.10.6\*

Sprinklers in areas where cubicle curtains are installed shall be in accordance with NFPA 13. [101:18.3.5.11]

13.3.2.11 Existing Health Care Occupancies

13.3.2.11.1

Buildings containing nursing homes shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3 and Section 9.7 of NFPA 101, unless otherwise permitted by 13.3.2.11.8. [101:19.3.5.1]

13.3.2.11.2

All high-rise buildings containing health care occupancies shall be protected throughout by an approved, supervised automatic sprinkler system installed in accordance with Section 13.3 within 12 years of the adoption of this Code, except as otherwise provided in 13.3.2.11.3 or 13.3.2.11.4. [101:19.4.3.1]

13.3.2.11.3

Where a jurisdiction adopts this edition of the Code and previously adopted the 2018 edition, the sprinklering required by 13.3.2.11.2 shall be installed within 9 years of the adoption of this Code. [101:19.4.3.2]

13.3.2.11.4

Where a jurisdiction adopts this edition of the Code and previously adopted the 2015 edition, the sprinklering required by 13.3.2.11.2 shall be installed within 6 years of the adoption of this Code. [101:19.4.3.3]

13.3.2.11.5

Where a jurisdiction adopts this edition of the Code and previously adopted the 2012 edition, the sprinklering required by 13.3.2.11.2 shall be installed within 3 years of the adoption of this Code. [101:19.4.3.4]

13.3.2.11.6

Where required by 19.1.6 of NFPA 101, buildings containing hospitals or limited care facilities shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3 and Section 9.7 of NFPA 101, unless otherwise permitted by 13.3.2.11.8. [101:19.3.5.3]

13.3.2.11.7\*

The sprinkler system required by 13.3.2.11.1 or 13.3.2.11.6 shall be installed in accordance with NFPA 13. [101:19.3.5.4]

13.3.2.11.8

In Type I and Type II construction, alternative protection measures shall be permitted to be substituted for sprinkler protection in specified areas where the AHJ has prohibited sprinklers, without causing a building to be classified as nonsprinklered. [101:19.3.5.5]

13.3.2.11.9\*

Where this Code permits exceptions for fully sprinklered buildings or smoke compartments, the sprinkler system shall meet all of the following criteria:

It shall be in accordance with Section 13.3.

It shall be installed in accordance with NFPA 13, unless it is an approved existing system.

It shall be electrically connected to the fire alarm system.

It shall be fully supervised.

In Type I and Type II construction, where the AHJ has prohibited sprinklers, approved alternative protection measures shall be permitted to be substituted for sprinkler protection in specified areas without causing a building to be classified as nonsprinklered.

[101:19.3.5.7]

13.3.2.11.10\*

Where this Code permits exceptions for fully sprinklered buildings or smoke compartments and specifically references this paragraph, the sprinkler system shall meet all of the following criteria:

It shall be installed throughout the building or smoke compartment in accordance with Section 13.3.

It shall be installed in accordance with NFPA 13, unless it is an approved existing system.

It shall be electrically connected to the fire alarm system.

It shall be fully supervised.

It shall be equipped with listed quick-response or listed residential sprinklers throughout all smoke compartments containing patient sleeping rooms.

\* Standard-response sprinklers shall be permitted to be continued to be used in approved existing sprinkler systems where quick-response and residential sprinklers were not listed for use in such locations at the time of installation.

Standard-response sprinklers shall be permitted for use in hazardous areas protected in accordance with 19.3.2.1 of NFPA 101.

[101:19.3.5.8]

13.3.2.11.11

Isolated hazardous areas shall be permitted to be protected in accordance with 13.3.1.4. For new installations in existing health care occupancies, where more than two sprinklers are installed in a single area, waterflow detection shall be provided to sound the building fire alarm or to notify, by a signal, any constantly attended location, such as PBX, security, or emergency room, at which the necessary corrective action shall be taken. [101:19.3.5.9]

13.3.2.11.12\*

Sprinklers shall not be required in clothes closets of patient sleeping rooms in hospitals where the area of the closet does not exceed 6 ft2 (0.55 m2), provided that the distance from the sprinkler in the patient sleeping room to the back wall of the closet does not exceed the maximum distance permitted by NFPA 13. [101:19.3.5.10]

13.3.2.11.13\*

Newly introduced cubicle curtains in sprinklered areas shall be installed in accordance with NFPA 13. [101:19.3.5.11]

13.3.2.12 New Detention and Correctional Facilities

13.3.2.12.1

All buildings classified as Use Condition II, Use Condition III, Use Condition IV, or Use Condition V shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.12.2. [101:22.3.5.2]

13.3.2.12.2

The automatic sprinkler system required by 13.3.2.12.1 shall meet all of the following criteria:

It shall be in accordance with Section 13.3.

It shall be installed in accordance with NFPA 13.

It shall be electrically connected to the fire alarm system.

It shall be fully supervised.

[101: 22.3.5.3]

13.3.2.13 Existing Detention and Correctional Facilities

13.3.2.13.1\*

Where required by Table 23.1.6.1 of NFPA 101, facilities shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.13.2. [101:23.3.5.2]

13.3.2.13.2

Where this Code permits exceptions for fully sprinklered detention and correctional occupancies or sprinklered smoke compartments, the sprinkler system shall meet all of the following criteria:

It shall be in accordance with Section 13.3.

It shall be installed in accordance with NFPA 13.

It shall be electrically connected to the fire alarm system.

It shall be fully supervised.

[101:23.3.5.3]

13.3.2.14 New Hotels and Dormitories

13.3.2.14.1

All buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.14.2. [101:28.3.5.1]

13.3.2.14.2

Where an automatic sprinkler system is installed, either for total or partial building coverage, the system shall be in accordance with Section 13.3, as modified by 13.3.2.14.3. In hotel or dormitory occupancies up to and including four stories in height that are located in buildings not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:28.3.5.3]

13.3.2.14.2.1

Where located in a building of Type III, Type IV, or Type V construction designed in accordance with 4.6.3(5) of NFPA 101 and where the roof assembly is located more than 55 ft (17 m) above the lowest level of required fire department vehicle access, attics shall comply with 13.3.2.14.2.1.1, 13.3.2.14.2.1.2, and one of the following:

Attics shall be provided with sprinkler protection.

Attics shall be constructed with noncombustible materials.

Attics shall be constructed with fire-retardant-treated wood.

Attics shall be filled with noncombustible insulation.

[101:28.3.5.3.1]

13.3.2.14.2.1.1

The height of the roof assembly shall be determined by measuring the distance from the lowest level of required fire department vehicle access adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. [101:28.3.5.3.1.1]

13.3.2.14.2.1.2

Required fire department vehicle access roads used in 13.3.2.14.2.1.1 shall include only those roads that are necessary for required fire department vehicle access in accordance with Section 18.2. [101:28.3.5.3.1.2]

13.3.2.14.3

The provisions for draft stops and closely spaced sprinklers in NFPA 13 shall not be required for openings complying with 8.6.9.1 of NFPA 101 where the opening is within the guest room or guest suite. [101:28.3.5.4]

13.3.2.14.4

Open parking structures that comply with NFPA 88A and are contiguous with hotels or dormitories shall be exempt from the sprinkler requirements of 13.3.2.14.1. [101:28.3.5.6]

13.3.2.15 Existing Hotels and Dormitories

13.3.2.15.1

All high-rise buildings, other than those where each guest room or guest suite has exterior exit access in accordance with 7.5.3 of NFPA 101, shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.15.2. [101:29.3.5.1]

13.3.2.15.2\*

Where an automatic sprinkler system is installed, either for total or partial building coverage, the system shall be in accordance with Section 13.3, as modified by 13.3.2.15.3 and 13.3.2.15.4. In buildings four or fewer stories in height and not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:29.3.5.3]

13.3.2.15.3

The provisions for draft stops and closely spaced sprinklers in NFPA 13 shall not be required for openings complying with 8.6.9.1 of NFPA 101 where the opening is within the guest room or guest suite. [101:29.3.5.4]

13.3.2.15.4

In guest rooms and in guest room suites, sprinkler installations shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2). [101:29.3.5.5]

13.3.2.16 New Apartment Buildings

13.3.2.16.1

All buildings shall be protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 13.3.2.16.1 through 13.3.2.16.6. [101:30.3.5.1]

13.3.2.16.1.1

Where an automatic sprinkler system is installed, the system shall be in accordance with Section 13.3, as modified by 13.3.2.16.5. [101:30.3.5.1.1]

13.3.2.16.1.2

In apartment buildings up to and including four stories in height, that are located in buildings not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:30.3.5.1.2]

13.3.2.16.2 Attics

Where located in a building of Type III, Type IV, or Type V construction designed in accordance with 4.6.3 (5) of NFPA 101 and where the roof assembly is located more than 55 ft (17 m) above the lowest level of required fire department vehicle access, attics shall comply with 13.3.2.16.2.1, 13.3.2.16.2.2, and one of the following:

Attics shall be provided with sprinkler protection.

Attics shall be constructed with noncombustible materials.

Attics shall be constructed with fire-retardant-treated wood.

Attics shall be filled with noncombustible insulation.

[101:30.3.5.2]

13.3.2.16.2.1

The height of the roof assembly shall be determined by measuring the distance from the lowest level of required fire department vehicle access adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. [101:30.3.5.2.1]

13.3.2.16.2.2

Required fire department vehicle access roads used in 13.3.2.16.2.1 shall include only those roads that are necessary for required fire department vehicle access in accordance with Section 18.2. [101:30.3.5.2.2]

13.3.2.16.3\*

In buildings sprinklered in accordance with NFPA 13, closets shall meet the following requirements:

Closets of less than 12 ft2 (1.1 m2) in area in individual dwelling units shall not be required to be sprinklered.

Closets that contain equipment such as washers, dryers, furnaces, or water heaters shall be sprinklered, regardless of size.[101:30.3.5.3]

13.3.2.16.4 Convenience Openings

The draft stop and closely spaced sprinkler requirements of NFPA 13 shall not be required for convenience openings complying with 8.6.9.1 of NFPA 101 where the convenience opening is within the dwelling unit. [101:30.3.5.4]

13.3.2.16.5 Open Parking Structures

Open parking structures complying with NFPA 88A that are contiguous with apartment buildings shall be exempt from the sprinkler requirements of 13.3.2.16.1. [101:30.3.5.5]

13.3.2.16.6 Unprotected Openings

Buildings with unprotected openings in accordance with 8.6.6 of NFPA 101 shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.16.1. [101:30.3.5.8]

13.3.2.17 Existing Apartment Buildings

13.3.2.17.1\*

Where an automatic sprinkler system is installed, either for total or partial building coverage, the system shall be installed in accordance with Section 13.3, as modified by 13.3.2.17.2 and 13.3.2.17.3. In buildings four or fewer stories in height and not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:31.3.5.2]

13.3.2.17.2

In individual dwelling units, sprinkler installation shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2). Closets that contain equipment such as washers, dryers, furnaces, or water heaters shall be sprinklered, regardless of size. [101:31.3.5.3]

13.3.2.17.3\*

In buildings sprinklered in accordance with NFPA 13 bathrooms not greater than 55 ft2 (5.1 m2) in individual dwelling units shall not be required to be sprinklered. [101:31.3.5.4]

13.3.2.17.4

The draft stop and closely spaced sprinkler requirements of NFPA 13 shall not be required for convenience openings complying with 8.6.9.1 of NFPA 101 where the convenience opening is within the dwelling unit. [101:31.3.5.5]

13.3.2.17.5

Buildings using Option 3 in accordance with NFPA 101 shall be provided with automatic sprinkler protection installed in accordance with 13.3.2.17.5.1 through 13.3.2.17.5.4. [101:31.3.5.6]

13.3.2.17.5.1

Automatic sprinklers shall be installed in the corridor, along the corridor ceiling, utilizing the maximum spacing requirements of the standards referenced by 13.3.1.2. [101:31.3.5.6.1]

13.3.2.17.5.2

An automatic sprinkler shall be installed within every dwelling unit that has a door opening to the corridor, with such sprinkler positioned over the center of the door, unless the door to the dwelling unit has not less than a 20-minute fire protection rating and is self-closing. [101:31.3.5.6.2]

13.3.2.17.5.3

The workmanship and materials of the sprinkler installation specified in 13.3.2.17.5 shall meet the requirements of 13.3.1.2. [101:31.3.5.6.3]

13.3.2.17.5.4

Where Option 3 is being used to permit the use of 13/4 in. (44 mm) thick, solid-bonded wood-core doors in accordance with 31.2.2.1.3 of NFPA 101, sprinklers shall be provided within the exit enclosures in accordance with NFPA 13. [101:31.3.5.6.4]

13.3.2.17.6

Buildings using Option 4 in accordance with NFPA 101 shall be protected throughout by an approved automatic sprinkler system in accordance with 13.3.2.17.1 and meeting the requirements of Section 13.3 for supervision for buildings seven or more stories in height. [101:31.3.5.7]

13.3.2.17.7\*

Where sprinklers are being used as an option to any requirement in this Code, the sprinklers shall be installed throughout the space in accordance with the requirements of that option. [101:31.3.5.8]

13.3.2.18 Lodging or Rooming Houses

13.3.2.18.1

All new lodging or rooming houses shall be protected throughout by an approved automatic sprinkler system in accordance with 13.3.2.18.2. [101:26.3.6.1]

13.3.2.18.2

Where an automatic sprinkler system is required or is used as an alternative method of protection, either for total or partial building coverage, the system shall be in accordance with Section 13.3 and 13.3.2.18.2.1 through 13.3.2.18.2.6. [101:26.3.6.2]

13.3.2.18.2.1

Activation of the automatic sprinkler system shall actuate the fire alarm system in accordance with Section 13.7. [101:26.3.6.2.1]

13.3.2.18.2.2

In buildings four or fewer stories in height and not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:26.3.6.2.2]

13.3.2.18.2.3\*

Systems in accordance with NFPA 13D shall be permitted where all of the following requirements are met:

The lodging or rooming house shall not be part of a mixed occupancy.

Entrance foyers shall be sprinklered.

Lodging or rooming houses with sleeping accommodations for more than eight occupants shall be treated as two-family dwellings with regard to the water supply.

[101:26.3.6.2.3]

13.3.2.18.2.4

In buildings sprinklered in accordance with NFPA 13 closets less than 12 ft2 (1.1 m2) in area in individual dwelling units shall not be required to be sprinklered. [101:26.3.6.2.4]

13.3.2.18.2.5

In buildings sprinklered in accordance with NFPA 13 closets that contain equipment such as washers, dryers, furnaces, or water heaters shall be sprinklered, regardless of size. [101:26.3.6.2.5]

13.3.2.18.2.6

In existing lodging or rooming houses, sprinkler installations shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2). [101:26.3.6.2.6]

13.3.2.19 One- And Two-Family Dwellings

13.3.2.19.1

All new one- and two-family dwellings shall be protected throughout by an approved automatic sprinkler system in accordance with 13.3.2.19.2. [101:24.3.5.1]

13.3.2.19.2

Where an automatic sprinkler system is installed, either for total or partial building coverage, the system shall be in accordance with Section 13.3. [101:24.3.5.2]

13.3.2.20 New Residential Board and Care Occupancies

13.3.2.20.1 Large Facilities

13.3.2.20.1.1 General

All buildings shall be protected throughout by an approved automatic sprinkler system installed in accordance with NFPA 13 and provided with quick-response or residential sprinklers throughout. [101:32.3.3.5.1]

13.3.2.20.1.2 Supervision

Automatic sprinkler systems shall be provided with electrical supervision in accordance with 13.3.1.8. [101:32.3.3.5.5]

13.3.2.20.2 Small Facilities

13.3.2.20.2.1\*

All facilities, other than those meeting the requirement of 13.3.2.20.2.2, shall be protected throughout by an approved automatic sprinkler system, installed in accordance with 13.3.2.20.2.3, using quick-response or residential sprinklers. [101:32.2.3.5.1]

13.3.2.20.2.2\*

In conversions, sprinklers shall not be required in small board and care homes serving eight or fewer residents when all occupants have the ability as a group to move reliably to a point of safety within 3 minutes. [101:32.2.3.5.2]

13.3.2.20.2.3

Where an automatic sprinkler system is installed, for either total or partial building coverage, all of the following requirements shall be met:

The system shall be in accordance with NFPA 13 and shall initiate the fire alarm system in accordance with 13.7.2.19.

The adequacy of the water supply shall be documented to the AHJ.

[101:32.2.3.5.3]

13.3.2.20.2.3.1

In buildings four or fewer stories in height and not exceeding 60 ft (18.3 m) in height above grade plane, systems in accordance with NFPA 13R shall be permitted. All habitable areas, closets, roofed porches, roofed decks, and roofed balconies shall be sprinklered. [101:32.2.3.5.3.1]

13.3.2.20.2.3.2\*

An automatic sprinkler system with a 30-minute water supply, and complying with all of the following requirements and with NFPA 13D, shall be permitted:

All habitable areas, closets, roofed porches, roofed decks, and roofed balconies shall be sprinklered.

Facilities with more than eight residents shall be treated as two-family dwellings with regard to water supply.

[101:32.2.3.5.3.2]

13.3.2.20.2.4

Automatic sprinkler systems installed in accordance with NFPA 13 and NFPA 13R shall be provided with electrical supervision in accordance with 13.3.1.8. [101:32.2.3.5.4]

13.3.2.20.2.5

Automatic sprinkler systems installed in accordance with NFPA 13D shall be provided with valve supervision by one of the following methods:

Single listed control valve that shuts off both domestic and sprinkler systems and separate shutoff for the domestic system only

Electrical supervision in accordance with 13.3.1.8

Valve closure that causes the sounding of an audible signal in the facility

[101:32.2.3.5.5]

13.3.2.20.2.6

Sprinkler piping serving not more than six sprinklers for any isolated hazardous area shall be permitted to be installed in accordance with 13.3.1.4 and shall meet all of the following requirements:

In new installations, where more than two sprinklers are installed in a single area, waterflow detection shall be provided to initiate the fire alarm system required by 13.7.2.19.

The duration of water supplies shall be as required by 13.3.2.20.2.3.2.

[101:32.2.3.5.6]

13.3.2.20.2.7

Attics shall be protected in accordance with 13.3.2.20.2.7.1 or 13.3.2.20.2.7.2. [101:32.2.3.5.7]

13.3.2.20.2.7.1

Where an automatic sprinkler system is required by 13.3.2.20.2, attics used for living purposes, storage, or fuel-fired equipment shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2. [101:32.2.3.5.7.1]

13.3.2.20.2.7.2

Where an automatic sprinkler system is required by 13.3.2.20.2, attics not used for living purposes, storage, or fuel-fired equipment shall meet one of the following criteria:

Attics shall be protected throughout by a heat detection system arranged to activate the building fire alarm system in accordance with Section 13.7.

Attics shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2.

Attics shall be of noncombustible or limited-combustible construction.

Attics shall be constructed of fire-retardant-treated wood in accordance with NFPA 703.

[101:32.2.3.5.7.2]

13.3.2.21 Existing Residential Board and Care Facilities

13.3.2.21.1 Large Facilities

13.3.2.21.1.1\* General

Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be installed in accordance with Section 13.3, as modified by 13.3.2.21.1.1.1 through 13.3.2.21.1.1.3. [101:33.3.3.5.1]

13.3.2.21.1.1.1

In buildings four or fewer stories above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:33.3.3.5.1.1]

13.3.2.21.1.1.2

In facilities having prompt or slow evacuation capability, automatic sprinklers shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2), provided that such spaces are finished with noncombustible or limited-combustible materials. [101:33.3.3.5.1.2]

13.3.2.21.1.1.3

Initiation of the fire alarm system shall not be required for existing installations in accordance with 13.3.2.21.1.6. [101:33.3.3.5.1.3]

13.3.2.21.1.2 Impractical Evacuation Capability

All facilities having impractical evacuation capability shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13. [101:33.3.3.5.2]

13.3.2.21.1.3 High-Rise Buildings

All high-rise buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.21.1. Such systems shall initiate the fire alarm system in accordance with 13.7.1.4. [101:33.3.3.5.3]

13.3.2.21.1.4

Attics shall be protected in accordance with 13.3.2.21.1.4.1 or 13.3.2.21.1.4.2. [101:33.3.3.5.4]

13.3.2.21.1.4.1

Where an automatic sprinkler system is installed, attics used for living purposes, storage, or fuel-fired equipment shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2. [101:33.3.3.5.4.1]

13.3.2.21.1.4.2

Where an automatic sprinkler system is installed, attics not used for living purposes, storage, or fuel-fired equipment shall meet one of the following criteria:

Attics shall be protected throughout by a heat detection system arranged to activate the building fire alarm system in accordance with Section 13.7.

Attics shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2.

Attics shall be of noncombustible or limited-combustible construction.

Attics shall be constructed of fire-retardant-treated wood in accordance with NFPA 703.

[101:33.3.3.5.4.2]

13.3.2.21.1.5 Supervision

Automatic sprinkler systems shall be supervised in accordance with Section 13.3; waterflow alarms shall not be required to be transmitted off-site. [101:33.3.3.5.5]

13.3.2.21.1.6 Domestic Water Supply Option

Sprinkler piping serving not more than six sprinklers for any isolated hazardous area in accordance with 13.3.1.4 shall be permitted; in new installations where more than two sprinklers are installed in a single area, waterflow detection shall be provided to initiate the fire alarm system required by 13.7.2.22. [101:33.3.3.5.6]

13.3.2.21.2 Small Facilities

13.3.2.21.2.1

Where an automatic sprinkler system is installed, for either total or partial building coverage, all of the following requirements shall be met:

The system shall be in accordance with Section 13.3 and shall initiate the fire alarm system in accordance with 13.7.2.21, as modified by 13.3.2.21.2.1.1 through 13.3.2.21.2.1.6.

The adequacy of the water supply shall be documented to the AHJ.

[101:33.2.3.5.3]

13.3.2.21.2.1.1\*

In prompt evacuation capability facilities, all of the following shall apply:

An automatic sprinkler system in accordance with NFPA 13D shall be permitted.

Automatic sprinklers shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2), provided that such spaces are finished with lath and plaster or materials providing a 15-minute thermal barrier.

[101:33.2.3.5.3.1]

13.3.2.21.2.1.2

In slow and impractical evacuation capability facilities, all of the following shall apply:

An automatic sprinkler system in accordance with NFPA 13D, with a 30-minute water supply, shall be permitted.

All habitable areas and closets shall be sprinklered.

Automatic sprinklers shall not be required in bathrooms not exceeding 55 ft2 (5.1 m2), provided that such spaces are finished with lath and plaster or materials providing a 15-minute thermal barrier.

[101:33.2.3.5.3.2]

13.3.2.21.2.1.3

In prompt and slow evacuation capability facilities, where an automatic sprinkler system is in accordance with NFPA 13, sprinklers shall not be required in closets not exceeding 24 ft2 (2.2 m2) and in bathrooms not exceeding 55 ft2 (5.1 m2), provided that such spaces are finished with lath and plaster or materials providing a 15-minute thermal barrier. [101:33.2.3.5.3.3]

13.3.2.21.2.1.4

In prompt and slow evacuation capability facilities in buildings four or fewer stories above grade plane, systems in accordance with NFPA 13R shall be permitted. [101:33.2.3.5.3.4]

13.3.2.21.2.1.5

In impractical evacuation capability facilities in buildings four or fewer stories above grade plane, systems in accordance with NFPA 13R shall be permitted. All habitable areas and closets shall be sprinklered. Automatic sprinklers shall not be required in bathrooms not exceeding 55 ft2 (5.1 m2), provided that such spaces are finished with lath and plaster or materials providing a 15-minute thermal barrier. [101:33.2.3.5.3.5]

13.3.2.21.2.1.6

Initiation of the fire alarm system shall not be required for existing installations in accordance with 13.3.2.21.3. [101:33.2.3.5.3.6]

13.3.2.21.2.2

All impractical evacuation capability facilities shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.21.2.1. [101:33.2.3.5.3.7]

13.3.2.21.3

Sprinkler piping serving not more than six sprinklers for any isolated hazardous area shall be permitted to be installed in accordance with 13.3.1.4 and shall meet all of the following requirements:

In new installations, where more than two sprinklers are installed in a single area, waterflow detection shall be provided to initiate the fire alarm system required by 13.7.2.21.

The duration of water supplies shall be as required for the sprinkler systems addressed in 13.3.2.21.2.1.

[101:33.2.3.5.6]

13.3.2.21.4

Attics shall be protected in accordance with 13.3.2.21.4.1 or 13.3.2.21.4.2. [101:33.2.3.5.7]

13.3.2.21.4.1

Where an automatic sprinkler system is installed, attics used for living purposes, storage, or fuel-fired equipment shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2. [101:33.2.3.5.7.1]

13.3.2.21.4.2

Where an automatic sprinkler system is installed, attics not used for living purposes, storage, or fuel-fired equipment shall meet one of the following criteria:

Attics shall be protected throughout by a heat detection system arranged to activate the building fire alarm system in accordance with Section 13.7.

Attics shall be protected with automatic sprinklers that are part of the required, approved automatic sprinkler system in accordance with 13.3.1.2.

Attics shall be of noncombustible or limited-combustible construction.

Attics shall be constructed of fire-retardant-treated wood in accordance with NFPA 703.

Attics shall be projected by heat alarms arranged to provide occupant notification in accordance with 13.7.2.21.3.

[101:33.2.3.5.7.2]

13.3.2.22 New Mercantile Occupancies

13.3.2.22.1

Mercantile occupancies shall be protected by an approved automatic sprinkler system in accordance with NFPA 13 in any of the following specified locations:

Throughout all mercantile occupancies three or more stories in height

Throughout all mercantile occupancies exceeding 12,000 ft2 (1115 m2) in gross area

Throughout stories below the level of exit discharge where such stories have an area exceeding 2500 ft2 (232 m2) and are used for the sale, storage, or handling of combustible goods and merchandise

Throughout multiple occupancies protected as mixed occupancies in accordance with 6.1.14 where the conditions of 13.3.2.22.1(1), 13.3.2.22.1(2), or 13.3.2.22.1(3) apply to the mercantile occupancy

[101:36.3.5.1]

13.3.2.22.2 Extinguishing Requirements

Bulk merchandising retail buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3 and the applicable provisions of the following:

This Code

NFPA 13

NFPA 30

NFPA 30B

[101:36.4.5.5]

13.3.2.22.3 Mall Buildings

13.3.2.22.3.1 Automatic Extinguishing Systems

13.3.2.22.3.1.1

The mall structure and all anchor buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13 and 13.3.2.22.3.1.2. [101:36.4.4.13.1]

13.3.2.22.3.1.2

The system shall be installed in such a manner that any portion of the system serving tenant spaces can be taken out of service without affecting the operation of the portion of the system serving the mall concourse. [101:36.4.4.13.2]

13.3.2.22.3.2 Hose Connections

13.3.2.22.3.2.1

There shall be a hose outlet connected to a system sized to deliver 250 gal/min (946 L/min) at the most hydraulically remote outlet. [5000:27.4.4.8.2.1]

13.3.2.22.3.2.2

The outlet shall be supplied from the mall concourse zone sprinkler system and shall be hydraulically calculated. [5000:27.4.4.8.2.2]

13.3.2.22.3.2.3

Hose outlets shall be provided at each of the following locations:

Within the mall concourse at the entrance to each exit passage or corridor

At each floor level landing within enclosed stairways opening directly onto the mall concourse

At exterior public entrances to the mall concourse

[5000:27.4.4.8.2.3]

13.3.2.23 Existing Mercantile Occupancies

13.3.2.23.1

Mercantile occupancies, other than one-story buildings that meet the requirements of a street floor, as defined in 3.3.273, shall be protected by an approved automatic sprinkler system in accordance with NFPA 13 in any of the following specified locations:

Throughout all mercantile occupancies with a story over 15.000 ft2 (1400 m2) in area

Throughout all mercantile occupancies exceeding 30.000 ft2 (2800 m2) in gross area

Throughout stories below the level of exit discharge where such stories have an area exceeding 2500 ft2 (232 m2) and are used for the sale, storage, or handling of combustible goods and merchandise

Throughout multiple occupancies protected as mixed occupancies in accordance with 6.1.14 where the conditions of 13.3.2.23.1(1), 13.3.2.23.1(2), or 13.3.2.23.1(3) apply to the mercantile occupancy

[101:37.3.5.1]

13.3.2.23.2

Bulk merchandising retail buildings shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3 and the applicable provisions of the following:

This Code

NFPA 13, Standard for the Installation of Sprinkler Systems

NFPA 30, Flammable and Combustible Liquids Code

NFPA 30B, Code for the Manufacture and Storage of Aerosol Products

[101:37.4.5.5]

13.3.2.24 Underground and Limited Access Structures

Underground and limited-access structures, and all areas and floor levels traversed in traveling to the exit discharge, shall be protected by an approved, supervised automatic sprinkler system in accordance with Section 13.3, unless such structures meet one of the following criteria:

They have an occupant load of 50 or fewer persons in new underground or limited-access portions of the structure.

They have an occupant load of 100 or fewer persons in existing underground or limited-access portions of the structure.

The structure is a one-story underground or limited-access structure that is permitted to have a single exit per Chapters 12 through 43 of NFPA 101, with a common path of travel not greater than 50 ft (15 m).

[101:11.7.3.4]

13.3.2.25 High-Rise Buildings

13.3.2.25.1

New high-rise buildings shall be protected throughout by an approved automatic sprinkler system in accordance with Section 13.3.

13.3.2.25.2\*

Existing high-rise buildings shall be protected throughout by an approved automatic sprinkler system in accordance with this chapter and 13.3.2.25.2.1 through 13.3.2.25.2.3.

13.3.2.25.2.1

Each building owner shall, within 180 days of receiving notice, file an intent to comply with this regulation with the AHJ for approval.

13.3.2.25.2.2

The AHJ shall review and respond to the intent-to-comply submittal within 60 days of receipt.

13.3.2.25.2.3\*

The entire building shall be required to be protected by an approved automatic sprinkler system within 12 years of adoption of this Code.

13.3.2.25.2.4 Public Disclosure Signage

In high-rise buildings that are not protected throughout by an approved automatic sprinkler system, signage shall be posted complying with 13.3.2.25.2.4(A) through 13.3.2.25.2.4(D).

(A)

Signage shall be posted at all main building entrances as approved by the AHJ.

(B)

The lettering on the sign shall be at least 1 in. (25 mm) high.

(C)

The lettering shall be placed on a contrasting background.

(D)

The wording shall state as follows:

WARNING:

This high-rise building is not protected throughout with an automatic fire sprinkler system.

13.3.2.26\* New Storage Occupancies

13.3.2.26.1 High-Piled Storage

An automatic sprinkler system shall be installed throughout all occupancies containing areas greater than 2500 ft2 (232 m2) for the high-piled storage of combustibles.

13.3.2.26.2\* General Storage

An automatic sprinkler system shall be installed throughout all occupancies containing areas greater than 12,000 ft2 (1115 m2) for the storage of combustibles.

13.3.2.26.3

An automatic sprinkler system shall be installed throughout all occupancies containing storage commodities classified as Group A Plastics in excess of 5 ft (1.5 m) in height over an area exceeding 2500 ft2 (232 m2) in area.

13.3.2.26.4 Bulk Storage of Tires

Buildings and structures where the volume for the storage of tires exceeds 20,000 ft3 (566 m3) shall be equipped throughout with an approved automatic fire sprinkler system. [5000:30.3.4.2]

13.3.2.26.5 Mini-Storage Building

An automatic sprinkler system shall be installed throughout all mini-storage buildings greater than 2500 ft2 (232 m2) and where any of the individual storage units are separated by less than a 1-hour fire-resistance-rated barrier. [5000:30.3.4.3]

13.3.2.27 Woodworking Operations

An approved automatic fire sprinkler system shall be installed in buildings containing woodworking operations exceeding 2500 ft2 (232 m2) that use equipment, machinery, or appliances; that generate finely divided combustible waste; or that use finely divided combustible materials. [5000:29.3.5.1.2]

13.3.2.28 New and Existing Day Care

Buildings with unprotected openings in accordance with 8.6.6 of NFPA 101 shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3. [101:16.3.5.3; 101:17.3.5.3]

13.3.2.29 New Industrial Occupancies

New industrial occupancies, other than low-hazard industrial occupancies, shall be protected by an approved automatic sprinkler system in accordance with NFPA 13 in any of the following locations:

Throughout all industrial occupancies three or more stories in height

Throughout all industrial occupancies exceeding 12,000 ft2 (1115 m2) in fire area

Where the total area of all floors, including mezzanines, exceeds 24,000 ft2 (2230 m2)

[5000:29.3.5.1.1]

13.3.3 Inspection, Testing, and Maintenance

13.3.3.1

A sprinkler system installed in accordance with this Code shall be properly maintained to provide at least the same level of performance and protection as designed. The owner shall be responsible for maintaining the system and keeping it in good working condition.

13.3.3.2

A sprinkler system installed in accordance with this Code shall be inspected, tested, and maintained in accordance with NFPA 25.

13.3.3.3 Ceiling Tiles and Ceiling Assemblies

Where automatic sprinklers are installed, ceilings necessary for the proper actuation of the fire protection device in accordance with NFPA 13 shall be maintained.

13.3.3.4 General Requirements

13.3.3.4.1 Responsibility of the Property Owner or Designated Representative

13.3.3.4.1.1\* Responsibility for Inspection, Testing, Maintenance, and Impairment

The property owner or designated representative shall be responsible for properly maintaining a water-based fire protection system. [25:4.1.1]

13.3.3.4.1.1.1

Inspection, testing, maintenance, and impairment procedures shall be implemented in accordance with those established in NFPA 25 and in accordance with the manufacturer's instructions. [25:4.1.1.1]

13.3.3.4.1.1.2

Inspection, testing, and maintenance shall be performed by qualified personnel. [25:4.1.1.2]

13.3.3.4.1.1.2.1\*

The owner shall coordinate with the entity conducting the inspection, testing, and maintenance activities to minimize any water damage caused by the discharge of water. [25:4.1.1.2.1]

13.3.3.4.1.1.3\*

Where the property owner or designated representative is not the occupant, the property owner or designated representative shall be permitted to delegate the authority for inspecting, testing, maintenance, and the managing of impairments of the fire protection system to a designated representative. [25:4.1.1.3]

13.3.3.4.1.1.4

Where a designated representative has received the authority for inspecting, testing, maintenance, and the managing of impairments, the designated representative shall comply with the requirements identified for the property owner or designated representative throughout this Code. [25:4.1.1.4]

13.3.3.4.1.2\* Freeze Protection

The property owner or designated representative shall ensure that water-filled piping is maintained at a minimum temperature of 40°F (4°C) unless an approved antifreeze solution is utilized. [25:4.1.2]

13.3.3.4.1.2.1\*

All areas of the building containing water-filled piping that does not have another means of freeze protection shall be maintained at a minimum temperature of 40°F (4°C). [25:4.1.2.1]

13.3.3.4.1.2.2\*

The requirements of 13.3.3.4.1.2 shall not apply where water-filled piping is located in unconditioned building spaces or areas outside the building envelope and are not subject to freezing. [25:4.1.2.2]

13.3.3.4.1.2.3

Aboveground water-filled pipes that pass through open areas, cold rooms, passageways, or other areas exposed to temperatures below 40°F (4°C), protected against freezing by insulating coverings, frostproof casings, listed heat tracing systems, or other reliable means shall be maintained at temperatures between 40°F (4°C) and 120°F (48.9°C). [25:4.1.2.3]

13.3.3.4.1.2.4

Where other approved means of freeze protection for water-filled piping as described in 13.3.3.4.1.2.3 are utilized they shall be inspected, tested, and maintained in accordance with NFPA 25. [25:4.1.2.4]

13.3.3.4.1.2.5

Valve enclosures for preaction valves, deluge valves, and dry pipe valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4°C). [25:4.1.2.5]

13.3.3.4.1.2.5.1

Valve enclosures equipped with low-temperature alarms shall be allowed to be inspected weekly. [25:4.1.2.5.1]

13.3.3.4.1.2.5.2

Low-temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage. [25:4.1.2.5.2]

13.3.3.4.1.3\* Accessibility

The property owner or designated representative shall provide ready accessibility to components of water-based fire protection systems that require inspection, testing, and maintenance. [25:4.1.3]

13.3.3.4.1.4 Notification of System Shutdown or Testing

The property owner or designated representative shall notify the AHJ, the fire department, if required, and the alarm-receiving facility before testing or shutting down a system or its supply. [25:4.1.4]

13.3.3.4.1.4.1

The notification of system shutdown or test shall include the purpose for the shutdown, the system or component involved, the estimated time of shutdown or test, and the expected duration of the shutdown or test. [25:4.1.4.1]

13.3.3.4.1.4.2

The AHJ, the fire department, and the alarm-receiving facility shall be notified when the system, supply, or component is returned to service or when the test is complete. [25:4.1.4.2]

13.3.3.4.1.5\* Corrections and Repairs

13.3.3.4.1.5.1\*

The property owner or designated representative shall correct or repair deficiencies or impairments. [25:4.1.5.1]

13.3.3.4.1.5.1.1\*

Upon discovery of any component and equipment under recall or replacement programs by the owner's maintenance personnel, designated representative, or contractor, the owner shall be notified in writing. [25:4.1.5.1.1]

13.3.3.4.1.5.1.2\*

The property owner or designated representative shall correct, remedy, repair, or replace components and equipment under recall or replacement program. [25:4.1.5.1.2]

13.3.3.4.1.5.2

Corrections and repairs shall be performed by qualified maintenance personnel or a qualified contractor. [25:4.1.5.2]

13.3.3.4.1.6\* Changes in Occupancy, Use, Process, or Materials

The property owner or designated representative shall not make changes in the occupancy, the use or process, or the materials used or stored in the building without evaluation of the fire protection system(s) for its capability to protect the new occupancy, use, or materials. [25:4.1.6]

13.3.3.4.1.6.1

The evaluation required by 13.3.3.4.1.6 shall not be considered part of the normal inspection, testing, and maintenance required by this Code. [25:4.1.6.1]

13.3.3.4.1.6.2\*

The evaluation shall consider factors that include, but are not limited to, the following:

Occupancy changes such as converting office or production space into warehousing

Process or material changes such as metal stamping to molded plastics

Building revisions such as relocated walls, added mezzanines, and ceilings added below sprinklers

Removal of heating systems in spaces with piping subject to freezing

Changes to the storage method, arrangement, height, or commodities

Changes in water supplies

[25:4.1.6.2]

13.3.3.4.1.7\* Addressing Changes in Hazard

13.3.3.4.1.7.1

Where changes in the occupancy, hazard, water supply, storage commodity, storage arrangement, building modification, or other condition that affects the installation criteria of the system are identified, the property owner or designated representative shall promptly take steps to evaluate the adequacy of the installed system in order to protect the building or hazard in question. [25:4.1.7.1]

13.3.3.4.1.7.2

Where the evaluation reveals that the installed system is inadequate to protect the building or hazard in question, the property owner or designated representative shall make the required corrections. [25:4.1.7.2]

13.3.3.4.1.7.3

Corrections shall be approved. [25:4.1.7.3]

13.3.3.4.1.8 Valve Location

The location of shutoff valves shall be identified at the system riser or other approved locations. [25:4.1.8]

13.3.3.4.1.9\* Information Sign

13.3.3.4.1.9.1

A permanently marked metal or rigid plastic information sign shall be placed at the system control riser supplying an antifreeze loop, dry system, preaction system, or auxiliary system control valve. [25:4.1.9.1]

13.3.3.4.1.9.2

Each sign shall be secured with a corrosion-resistant wire, chain, or other approved means and shall indicate at least the following information:

Location of the area served by the system

Location of auxiliary drains and low-point drains for dry pipe and preaction systems

Presence and location of antifreeze or other auxiliary systems

Presence and location(s) of heat tape

[25:4.1.9.2]

13.3.3.4.1.10\* Hydraulic Design Information Sign

The hydraulic design information sign shall be inspected annually to verify that it is provided, attached securely to the sprinkler riser, and is legible. [25:5.2.5]

13.3.3.4.1.10.1

A hydraulic design information sign that is missing or illegible shall be replaced. [25:5.2.5.1]

13.3.3.4.1.10.2

A pipe schedule system shall have a hydraulic design information sign that reads "Pipe Schedule System." [25:5.2.5.2]

13.3.3.4.1.11 Antifreeze Information Sign

An antifreeze information sign shall be placed on the antifreeze system main valve, which indicates the manufacture type and brand of the antifreeze solution, the concentration by volume of the antifreeze solution used, and the volume of the antifreeze solution used in the system. [25:4.1.10]

13.3.3.4.1.12 Impairments

13.3.3.4.1.12.1

Where an impairment to a water-based fire protection system occurs or is identified during inspection, testing, or maintenance activities, the procedures outlined in Chapter 15 of NFPA 25 shall be followed, including the attachment of a tag to the impaired system. [25:4.1.11.1]

13.3.3.4.1.12.2

Where a water-based fire protection system is returned to service following an impairment, the system shall be verified to be working properly by means of an appropriate inspection or test as described in the table "Summary of Component Replacement [Action] Requirements" in the applicable chapters of NFPA 25. [25:4.1.11.2]

13.3.3.4.2 Manufacturer's Corrective Action

Manufacturers shall be permitted to make modifications to their own listed product in the field with listed devices that restore the original performance as intended by the listing, where acceptable to the AHJ. [25:4.2]

13.3.3.4.3 Records

13.3.3.4.3.1\*

Records shall be made for all inspections, tests, and maintenance of the system and its components. [25:4.3.1]

13.3.3.4.3.1.1\*

Records shall be maintained by the property owner. [25:4.3.1.1]

13.3.3.4.3.1.2\*

Records shall be permitted to be stored and accessed electronically. [25:4.3.1.2]

13.3.3.4.3.2

Records shall indicate the following:

The procedure/activity performed (e.g., inspection, test, or maintenance)

The organization that performed the activity

The required frequency of the activity

The results and date of the activity

The name and contact information of the qualified contractor or owner, including lead person for activity

[25:4.3.2]

13.3.3.4.3.3

Records shall be made available to the AHJ upon request. [25:4.3.3]

13.3.3.4.3.4

As-built system installation drawings, hydraulic calculations, original acceptance test records, and device manufacturer's data sheets shall be retained for the life of the system. [25:4.3.4]

13.3.3.4.3.5

Subsequent records shall be retained for a period of 1 year after the next inspection, test, or maintenance of that type required by the Code. [25:4.3.5]

13.3.3.5 Sprinkler Systems

13.3.3.5.1 Maintenance — Sprinklers

13.3.3.5.1.1

Where a sprinkler has been removed for any reason, it shall not be reinstalled. [25:5.4.1.1]

13.3.3.5.1.2\*

Replacement sprinklers shall have the proper characteristics for the application intended, which include the following:

Style

Orifice size and K-factor

Temperature rating

Coating, if any

Deflector type (e.g., upright, pendent, sidewall)

Design requirements

[25:5.4.1.2]

13.3.3.5.1.2.1\*

Spray sprinklers shall be permitted to replace old-style sprinklers. [25:5.4.1.2.1]

13.3.3.5.1.2.2\*

Where replacing residential sprinklers manufactured prior to 2003 that are no longer available from the manufacturer and are installed using a design density less than 0.05 gpm/ft2 (204 mm/min), a residential sprinkler with an equivalent K-factor (± 5 percent) shall be permitted to be used provided the currently listed coverage area for the replacement sprinkler is not exceeded. [25:5.4.1.2.2]

13.3.3.5.1.2.3

Replacement sprinklers for piers and wharves shall comply with NFPA 307. [25:5.4.1.2.3]

13.3.3.5.1.3

Only new, listed sprinklers shall be used to replace existing sprinklers. [25:5.4.1.3]

13.3.3.5.1.4\*

Special and quick-response sprinklers as defined by NFPA 13 shall be replaced with sprinklers of the same orifice, size, temperature range and thermal response characteristics, and K-factor. [25:5.4.1.4]

13.3.3.5.1.5\* Stock of Spare Sprinklers

A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced. [25:5.4.1.5]

13.3.3.5.1.5.1

The sprinklers shall correspond to the types and temperature ratings of the sprinklers in the property. [25:5.4.1.5.1]

13.3.3.5.1.5.2

The stock of spare sprinklers shall be kept in a cabinet located where the temperature to which they are subjected will at no time exceed the maximum ceiling temperatures specified in Table 13.3.3.5.1.5.2 for each of the sprinklers within the cabinet. [25:5.4.1.5.2]

Table 13.3.3.5.1.5.2 Temperature Ratings, Classifications, and Color Codings

Maximum Ceiling

Temperature

Temperature Rating

Temperature

Classification

Color Code

Glass Bulb

Colors

°F

°C

°F

°C

100

38

135—170

57—77

Ordinary

Uncolored

or black

Orange or

red

150

66

175—225

79—107

Intermediate

White Yellow or

green

225

107

250—300

121—149

High

Blue Blue

300

149

325—375

163—191

Extra high

Red Purple

375

191

400—475

204—246

Very extra high

Green Black

475

246

500—575

260—302

Ultra high

Orange Black

625

329

650

343

Ultra high

Orange Black

[25:Table 5.4.1.5.2]

13.3.3.5.1.5.3

Where dry sprinklers of different lengths are installed, spare dry sprinklers shall not be required, provided that a means of returning the system to service is furnished. [25:5.4.1.5.3]

13.3.3.5.1.5.4

The stock of spare sprinklers shall include all types and ratings installed and shall be as follows:

For protected facilities having under 300 sprinklers — no fewer than 6 sprinklers

For protected facilities having 300 to 1000 sprinklers — no fewer than 12 sprinklers

For protected facilities having over 1000 sprinklers — no fewer than 24 sprinklers

[25:5.4.1.5.4]

13.3.3.5.1.5.5\*

One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed to be used for the removal and installation of sprinklers in the system. [25:5.4.1.5.5]

13.3.3.5.1.5.6

A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet. [25:5.4.1.5.6]

13.3.3.5.1.5.6.1\*

The list shall include the following:

Sprinkler identification number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating

General description

Quantity of each type to be contained in the cabinet

Issue or revision date of the list

[25:5.4.1.5.6.1]

13.3.3.5.1.6\*

Sprinklers shall not be altered in any respect or have any type of ornamentation, paint, or coatings applied after shipment from the place of manufacture. [25:5.4.1.6]

13.3.3.5.1.7

Sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilating systems shall be replaced annually. [25:5.4.1.7]

13.3.3.5.1.7.1

Where automatic bulb-type sprinklers or spray nozzles are used and annual examination shows no buildup of grease or other material on the sprinklers or spray nozzles, such sprinklers and spray nozzles shall not be required to be replaced. [25:5.4.1.7.1]

13.3.3.5.1.8

Electrically operated sprinklers shall be maintained in accordance with the manufacturer's requirements. [25:5.4.1.8]

13.3.3.5.1.9 Protective Coverings

13.3.3.5.1.9.1\*

Sprinklers protecting spray areas and mixing rooms in resin application areas installed with protective coverings shall continue to be protected against overspray residue so that they will operate in the event of fire. [25:5.4.1.9.1]

13.3.3.5.1.9.2

Sprinklers installed as described in 13.3.3.5.1.9.1 shall be protected using cellophane bags having a thickness of 0.003 in. (0.076 mm) or less or thin paper bags. [25:5.4.1.9.2]

13.3.3.5.1.9.3

Coverings shall be replaced periodically so that heavy deposits of residue do not accumulate. [25:5.4.1.9.3]

13.3.3.5.2\* Maintenance — Dry Pipe Systems

Dry pipe systems shall be kept dry at all times. [25:5.4.2]

13.3.3.5.2.1

During nonfreezing weather, a dry pipe system shall be permitted to be left wet if the only other option is to remove the system from service while waiting for parts or during repair activities. [25:5.4.2.1]

13.3.3.5.2.2

Refrigerated spaces or other areas within the building interior where temperatures are maintained at or below 40°F (4°C) shall not be permitted to be left wet. [25:5.4.2.2]

13.3.3.5.2.3

Air driers shall be maintained in accordance with the manufacturer's instructions. [25:5.4.2.3]

13.3.3.5.2.4

Compressors used in conjunction with dry pipe sprinkler systems shall be maintained in accordance with Chapter 13 of NFPA 25 and the manufacturer's instructions. [25:5.4.2.4]

13.3.3.6 Impairments

13.3.3.6.1 General

13.3.3.6.1.1 Minimum Requirements

13.3.3.6.1.1.1

Sub-subsection 13.3.3.6 shall provide the minimum requirements for a water-based fire protection system impairment program. [25:15.1.1.1]

13.3.3.6.1.1.2

Measures shall be taken during the impairment to ensure that increased risks are minimized and the duration of the impairment is limited. [25:15.1.1.2]

13.3.3.6.2 Impairment Coordinator

13.3.3.6.2.1

The property owner or designated representative shall assign an impairment coordinator to comply with the requirements of 13.3.3.6. [25:15.2.1]

13.3.3.6.2.2

In the absence of a specific designee, the property owner or designated representative shall be considered the impairment coordinator. [25:15.2.2]

13.3.3.6.2.3

Where the lease, written use agreement, or management contract specifically grants the authority for inspection, testing, and maintenance of the fire protection system (s) to the tenant, management firm, or managing individual, the tenant, management firm, or managing individual shall assign a person as impairment coordinator. [25:15.2.3]

13.3.3.6.3 Tag Impairment System

13.3.3.6.3.1\*

A tag shall be used to indicate that a system, or part thereof, has been removed from service. [25:15.3.1]

13.3.3.6.3.2\*

The tag shall be posted at each fire department connection and the system control valve, and other locations required by the AHJ indicating which system, or part thereof, has been removed from service. [25:15.3.2]

13.3.3.6.4 Impaired Equipment

13.3.3.6.4.1

The impaired equipment shall be considered to be the water-based fire protection system, or part thereof, that is removed from service. [25:15.4.1]

13.3.3.6.4.2

The impaired equipment shall include, but shall not be limited to, the following:

Sprinkler systems

Standpipe systems

Fire hose systems

Underground fire service mains

Fire pumps

Water storage tanks

Water spray fixed systems

Foam-water sprinkler systems

Water mist systems

Fire service control valves

Water supply

[25:15.4.2]

13.3.3.6.5\* Preplanned Impairment Programs

13.3.3.6.5.1

All preplanned impairments shall be authorized by the impairment coordinator. [25:15.5.1]

13.3.3.6.5.2

Before authorization is given, the impairment coordinator shall be responsible for verifying that the following procedures have been implemented:

The extent and expected duration of the impairment have been determined.

The areas or buildings involved have been inspected and the increased risks determined.

Recommendations to mitigate any increased risks have been submitted to management or the property owner or designated representative.

Where a fire protection system is out of service for more than 10 hours in a 24-hour period, the impairment coordinator shall arrange for one of the following:

Evacuation of the building or portion of the building affected by the system out of service

\* An approved fire watch

\* Establishment of a temporary water supply

\* Establishment and implementation of an approved program to eliminate potential ignition sources and limit the amount of fuel available to the fire

The fire department has been notified.

The insurance carrier, the alarm company, property owner or designated representative, and other AHJs have been notified.

The supervisors in the areas to be affected have been notified.

A tag impairment system has been implemented. (See 13.3.3.6.3.)

All necessary tools and materials have been assembled on the impairment site.

[25:15.5.2]

13.3.3.6.6\* Emergency Impairments

13.3.3.6.6.1

Emergency impairments shall include, but are not limited to, interruption of water supply, frozen or ruptured piping, and equipment failure, and includes impairments found during inspection, testing, or maintenance activities. [25:15.6.1]

13.3.3.6.6.2\*

The coordinator shall implement the steps outlined in 13.3.3.6.5. [25:15.6.2]

13.3.3.6.7\* Restoring Systems to Service

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

Any necessary inspections and tests have been conducted to verify that affected systems are operational. The appropriate chapter of NFPA 25 shall be consulted for guidance on the type of inspection and test required.

Supervisors have been advised that protection is restored.

The fire department has been advised that protection is restored.

The property owner or designated representative, insurance carrier, alarm company, and other AHJs have been advised that protection is restored.

The impairment tag has been removed.

[25:15.7]

13.4 Fire Pumps

13.4.1 General

13.4.1.1

Where provided, fire pumps shall be installed in accordance with NFPA 20 and Section 13.4.

13.4.1.2 Permits

Permits, where required, shall comply with Section 1.12.

13.4.1.3 Pump Operation

13.4.1.3.1 Service Personnel Qualifications and Experience

13.4.1.3.1.1

Service personnel shall be qualified and experienced in the inspection, testing, and maintenance of fire protection systems. [20:4.3.4.1]

13.4.1.3.1.2

Qualified personnel shall include, but not be limited to, one or more of the following:

Personnel who are factory trained and certified for fire pump system servicing of the specific type and brand of system being designed

Personnel who are certified by a nationally recognized fire protection certification organization acceptable to the AHJ

Personnel who are registered, licensed, or certified by a state or local authority

Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of fire protection systems

[20:4.3.4.2]

13.4.1.3.1.3

Additional evidence of qualification or certification shall be permitted to be required by the AHJ. [20:4.3.4.3]

13.4.2\* Valve Supervision

13.4.2.1 Supervised Open

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

Central station, proprietary, or remote station signaling service

Local signaling service that will cause the sounding of an audible signal at a constantly attended point

Locking valves open

Sealing of valves and approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner

[20:4.18.1]

13.4.2.2 Supervised Closed

Control valves located in the pipeline to the hose valve header shall be supervised closed by one of the methods allowed in 13.4.2.1. [20:4.18.2]

13.4.3 Diesel Engine Driver System Operation

13.4.3.1 Emergency Starting and Stopping

13.4.3.1.1

The sequence for emergency manual operation, arranged in a step-by-step manner, shall be posted on the fire pump engine. [20:11.6.6.1]

13.4.3.1.2

It shall be the engine manufacturer's responsibility to list any specific instructions pertaining to the operation of this equipment during the emergency operation. [20:11.6.6.2]

13.4.3.2\* Certified Pump Curve

13.4.3.2.1

A copy of the manufacturer's certified pump test curve shall be available for comparison with the results of the field acceptance test. [20:14.2.4.1]

13.4.3.2.1.1

For water mist positive displacement pumping units, a copy of the manufacturer's certified shop test data for both variable speed and non-variable speed operation shall be available for comparison of the results of the field acceptance test. [20:14.2.4.1.1]

13.4.3.2.1.2

For multistage multiport pumps, a copy of the manufacturer's certified shop test data for each discharge outlet shall be available for comparison with the results of the field acceptance test. [20:14.2.4.1.2]

13.4.3.2.1.3

For self-regulating variable speed fire pump units, a copy of the manufacturer's test curves for self-regulating variable speed constant boost mode, self-regulating variable speed constant discharge mode, and bypass constant speed mode shall be available. [20:14.2.4.1.3]

13.4.4 Periodic Inspection, Testing, and Maintenance

Fire pumps shall be inspected, tested, and maintained in accordance with NFPA 25. [20:14.4]

13.4.5 Component Replacement

Component replacement in a fire pump shall be in accordance with NFPA 20.

13.5 Water Supply

13.5.1

Private fire service mains shall be installed in accordance with NFPA 13 and NFPA 24.

13.5.1.1

NFPA 24 shall not apply to underground mains serving sprinkler systems designed and installed in accordance with NFPA 13R that are less than 4 in. (100 mm) in nominal diameter. [24:1.1.4]

13.5.1.2

NFPA 24 shall not apply to underground mains serving sprinkler systems designed and installed in accordance with NFPA 13D. [24:1.1.5]

13.5.2

Where no adequate and reliable water supply exists for fire-fighting purposes, the requirements of NFPA 1142 shall apply.

13.5.3\*

The installation of devices to protect the public water supply from contamination shall comply with the provisions of NFPA 13, NFPA 13D, NFPA 13R, NFPA 24, and the plumbing code.

13.5.3.1

Backflow prevention devices shall be inspected, tested, and maintained in accordance with the requirements of NFPA 25.

13.5.4 Inspection, Testing, and Maintenance

13.5.4.1

A private fire service main installed in accordance with this Code shall be properly maintained to provide at least the same level of performance and protection as designed. The owner shall be responsible for maintaining the system and keeping it in good working condition.

13.5.4.2

A private fire service main installed in accordance with this Code shall be inspected, tested, and maintained in accordance with NFPA 25.

13.6 Portable Fire Extinguishers

Upcodes Diagrams

13.6.1 General Requirements

13.6.1.1 Scope

The selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers shall be in accordance with NFPA 10 and Section 13.6.

13.6.1.1.1

The requirements given herein are minimum. [10:1.1.1]

13.6.1.1.2

The requirements shall not apply to permanently installed systems for fire extinguishment, even where portions of such systems are portable (such as hose and nozzles attached to a fixed supply of extinguishing agent). [10:1.1.2]

13.6.1.2\* Where Required

Fire extinguishers shall be provided where required by this Code as specified in Table 13.6.1.2 and the referenced codes and standards listed in Chapter 2.

Table 13.6.1.2 Portable Fire Extinguishers Required

Occupancy Use

Where Required

Ambulatory health care occupancies

Yes

Apartment occupanciesa

Yes

Assembly occupanciesb

Yes

Business occupancies

Yes

Day-care occupancies

Yes

Detention and correctional occupanciesc,d

Yes

Educational occupancies

Yes

Health care occupancies

Yes

Hotel and dormitory occupancies

Yes

Industrial occupancies

Yes

Lodging and rooming house occupancies

Yes

Mercantile occupancies

Yes

Occupancies in special structures

Yes

One- and two-family dwelling occupancies

No

Residential board and care occupancies

Yes

Storage occupanciese

Yes

aPortable fire extinguishers shall be permitted to be located at exterior locations or interior locations so that all portions of the buildings are within 75 ft (22.8 m) of travel distance to an extinguishing unit.

bPortable fire extinguishers are not required in seating or outdoor performance areas.

cAccess to portable fire extinguishers shall be permitted to be locked.

dPortable fire extinguishers shall be permitted to be located at staff locations only.

eIn storage areas where forklift, powered industrial truck, or cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, need not be provided when:

Use of vehicle-mounted extinguishers is approved by the AHJ.

Each vehicle is equipped with a 10 lb, 40-A:80-B:C extinguisher affixed to the vehicle using a mounting bracket approved by the extinguisher manufacturer or the AHJ for vehicular use.

Not less than two spare extinguishers of equal or greater rating are available onsite to replace a discharged extinguisher.

Vehicle operators are trained in the proper operation and use of the extinguisher.

Inspections of vehicle-mounted extinguishers are performed daily.

13.6.1.3 Listing and Labeling

13.6.1.3.1\*

Portable fire extinguishers used to comply with Section 13.6 shall be listed and labeled and shall meet or exceed all the requirements of UL 711, CAN/ULC-S508, Rating and Fire Testing of Fire Extinguishers, and one of the following applicable performance standards:

Carbon dioxide types: UL 154, CAN/ULC-S503, Carbon-Dioxide Fire Extinguishers

Dry chemical types: UL 299, CAN/ULC-S504, Dry Chemical Fire Extinguishers

Water types: UL 626, CAN/ULC-S507, Water Fire Extinguishers

Halon types: CAN/ULC-S512, Halogenated Agent Hand and Wheeled Fire Extinguishers

Film-forming foam types: UL 8, CAN/ULC-S554, Water Based Agent Fire Extinguishers

Halocarbon types: UL 2129, CAN/ULC-S566, Halocarbon Clean Agent Fire Extinguishers

[10:4.1.1]

13.6.1.3.2\*

Each fire extinguisher shall be marked with the following:

Identification of the listing and labeling organization

Product category indicating the type of extinguisher

Extinguisher classification as indicated in Section 5.3 of NFPA 10

Performance and fire test standards that the extinguisher meets or exceeds

[10:4.1.2]

13.6.1.3.2.1

Halon extinguishers listed and labeled to UL 1093, Halogenated Agent Fire Extinguishers, shall be permitted to be used to comply with the requirements of Section 13.6 when installed, inspected and maintained in accordance with Section 13.6. [10:4.1.2.2]

13.6.1.3.3 Electrical Conductivity

Extinguishers listed for the Class C rating shall not contain an agent that is a conductor of electricity. [10:4.1.4]

13.6.1.3.3.1

In addition to successfully meeting the requirements of UL 711, CAN/ULC-S508, Rating and Fire Testing of Fire Extinguishers, water-based agents that are listed for the Class C rating shall be tested in accordance with ASTM D5391, Standard Test for Electrical Conductivity and Resistivity of a Rowing High Purity Water Sample. [10:4.1.4.1]

13.6.1.3.3.2

Fire extinguishers containing water-based agents that have a conductivity higher than 1.00 µS/cm at 77°F (25°C) shall be considered a conductor of electricity and therefore shall not be rated Class C. [10:4.1.4.2]

13.6.1.3.3.3

Paragraphs 13.6.1.3.3.1 and 13.6.1.3.3.2 shall apply only to water-based extinguishers manufactured after August 15, 2002. [10:4.1.4.3]

13.6.1.4\* Identification of Contents

A fire extinguisher shall have a label, tag, or stencil attached to it providing the following information:

The content's product name as it appears on the manufacturer's Material Safety Data Sheet (MSDS)

Listing of the hazardous material identification in accordance with Hazardous Materials Identification System (HMIS), Implementation Manual [in Canada, Globally Harmonized System of Classification and Labeling of Chemicals (GHS)] developed by the National Paint and Coatings Association

List of any hazardous materials that are in excess of 1.0 percent of the contents

List of each chemical in excess of 5.0 percent of the contents

Information as to what is hazardous about the agent in accordance with the MSDS

Manufacturer's or service agency's name, mailing address, and phone number

[10:4.2]

13.6.1.5 Obsolete Fire Extinguishers

The following types of fire extinguishers are considered obsolete and shall be removed from service:

Soda acid

Chemical foam (excluding film-forming agents)

Carbon tetrachloride, methyl bromide, and chlorobromomethane (CBM)

Cartridge-operated water

Cartridge-operated loaded stream

Copper or brass shell (excluding pump tanks) joined by soft solder or rivets

Carbon dioxide extinguishers with metal horns

Solid charge—type AFFF extinguishers (paper cartridge)

Pressurized water fire extinguishers manufactured prior to 1971

Any extinguisher that needs to be inverted to operate

Any extinguisher manufactured prior to 1955

Any extinguishers with 4B, 6B, 8B, 12B, and 16B fire ratings

Stored-pressure water extinguishers with fiberglass shells (pre-1976)

[10:4.4]

13.6.1.5.1\*

Dry chemical stored-pressure extinguishers with an indicated manufacturing date of 1984 or prior shall be removed from service. [10:4.4.1]

13.6.1.5.1.1

Paragraph 13.6.1.5.1 shall not apply to wheeled-type dry chemical stored-pressure fire extinguishers. [10:4.4.1.1]

13.6.1.5.2\*

Any fire extinguisher that can no longer be serviced in accordance with the manufacturer's maintenance manual is considered obsolete and shall be removed from service. [10:4.4.2]

13.6.2 Selection of Portable Fire Extinguishers

13.6.2.1 General Requirements

The selection of fire extinguishers for a given situation shall be determined by the applicable requirements of Sections 5.2 through 5.6 of NFPA 10 and the following factors:

Type of fire most likely to occur

Size of fire most likely to occur

Hazards in the area where the fire is most likely to occur

Energized electrical equipment in the vicinity of the fire

Ambient temperature conditions

Other factors (see Section H.2 of NFPA 10)

[10:5.1]

13.6.2.1.1

Portable fire extinguishers shall be installed as a first line of defense to cope with fires of limited size, except as required by 5.5.5 of NFPA 10. [10:5.1.1]

13.6.2.1.2

The selection of extinguishers shall be independent of whether the building is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment. [10:5.1.2]

13.6.2.2 Classification of Fires

See 3.3.115.

13.6.2.3 Extinguisher Classification System

13.6.2.3.1

The classification of fire extinguishers shall consist of a letter that indicates the class of fire on which a fire extinguisher has been found to be effective. [10:5.3.1]

13.6.2.3.1.1

Fire extinguishers classified for use on Class A or Class B hazards shall be required to have a rating number preceding the classification letter that indicates the relative extinguishing effectiveness. [10:5.3.1.1]

13.6.2.3.1.2

Fire extinguishers classified for use on Class C, Class D, or Class K hazards shall not be required to have a number preceding the classification letter. [10:5.3.1.2]

13.6.2.3.2

Fire extinguishers shall be selected for the class(es) of hazards to be protected in accordance with 13.6.2.3.2.1 through 13.6.2.3.2.5. (For specific hazards, see Section 5.5 of NFPA 10.) [10:5.3.2]

13.6.2.3.2.1\*

Fire extinguishers for the protection of Class A hazards shall be selected from types that are specifically listed and labeled for use on Class A fires. (For halon agent—type extinguishers, see 13.6.2.3.2.6.) [10:5.3.2.1]

13.6.2.3.2.2\*

Fire extinguishers for the protection of Class B hazards shall be selected from types that are specifically listed and labeled for use on Class B fires. (For halon agent—type extinguishers, see 13.6.2.3.2.6.) [10:5.3.2.2]

13.6.2.3.2.3\*

Fire extinguishers for the protection of Class C hazards shall be selected from types that are specifically listed and labeled for use on Class C hazards. (For halon agent—type fire extinguishers, see 13.6.2.3.2.6.) [10:5.3.2.3]

13.6.2.3.2.4\*

Fire extinguishers and extinguishing agents for the protection of Class D hazards shall be of the types specifically listed and labeled for use on the specific combustible metal hazard. [10:5.3.2.4]

13.6.2.3.2.5

Fire extinguishers for the protection of Class K hazards shall be selected from types that are specifically listed and labeled for use on Class K fires. [10:5.3.2.5]

13.6.2.3.2.6\*

Use of halon agent fire extinguishers shall be limited to applications where a clean agent is necessary to extinguish fire efficiently without damaging the equipment or area being protected, or where the use of alternative agents has the potential to cause a hazard to personnel in the area. [10:5.3.2.6]

13.6.2.3.2.6.1\*

Placement of portable fire extinguishers containing halogenated agents shall conform to minimum confined space volume requirement warnings contained on the fire extinguisher nameplates. [10:5.3.2.6.1]

13.6.2.3.2.7\*

Wheeled fire extinguishers shall be considered for hazard protection in areas in which a fire risk assessment has shown the following:

High hazard areas are present

Limited available personnel are present, thereby requiring an extinguisher that has the following features:

High agent flow rate

Increased agent stream range

Increased agent capacity

[10:5.3.2.7]

13.6.2.4 Classification of Hazards

13.6.2.4.1 Classifying Occupancy Hazard

Rooms or areas shall be classified as being light hazard, ordinary hazard, or extra hazard. [10:5.4.1]

13.6.2.4.1.1\* Light Hazard

Light hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustibles and Class B flammables are low and fires with relatively low rates of heat release are expected. These occupancies consist of fire hazards having normally expected quantities of Class A combustible furnishings, and/or the total quantity of Class B flammables typically expected to be present is less than 1 gal (3.8 L) in any room or area. [10:5.4.1.1]

13.6.2.4.1.2\* Ordinary Hazard

Ordinary hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustible materials and Class B flammables are moderate and fires with moderate rates of heat release are expected. These occupancies consist of fire hazards that only occasionally contain Class A combustible materials beyond normal anticipated furnishings, and/or the total quantity of Class B flammables typically expected to be present is from 1 gal to 5 gal (3.8 L to 18.9 L) in any room or area. [10:5.4.1.2]

13.6.2.4.1.3\* Extra Hazard

Extra hazard occupancies shall be classified as locations where the quantity and combustibility of Class A combustible material are high or where high amounts of Class B flammables are present and rapidly developing fires with high rates of heat release are expected. These occupancies consist of fire hazards involved with the storage, packaging, handling, or manufacture of Class A combustibles, and/or the total quantity of Class B flammables expected to be present is more than 5 gal (18.9 L) in any room or area. [10:5.4.1.3]

13.6.2.4.1.4

Limited areas of greater or lesser hazard shall be protected as required. [10:5.4.1.4]

13.6.2.4.2\* Selection by Occupancy

Fire extinguishers shall be provided for the protection of both the building structure and the occupancy hazards contained therein regardless of the presence of any fixed fire suppression systems. [10:5.4.2]

13.6.2.4.2.1

Required building protection shall be provided by fire extinguishers for Class A fires. [10:5.4.2.1]

13.6.2.4.2.2\*

Occupancy hazard protection shall be provided by fire extinguishers for such Class A, B, C, D, or K fire potentials as might be present. [10:5.4.2.2]

13.6.2.4.2.3

Fire extinguishers provided for building protection shall be permitted to also be considered for the protection of occupancies having a Class A fire potential. [10:5.4.2.3]

13.6.2.4.2.4

Buildings having an occupancy hazard subject to Class B or Class C fires, or both, shall have a standard complement of Class A fire extinguishers for building protection, plus additional Class B or Class C fire extinguishers, or both. [10:5.4.2.4]

13.6.2.4.2.5

Where fire extinguishers have more than one letter classification (such as 2-A:20-B:C), they shall be permitted to satisfy the requirements of each letter class. [10:5.4.2.5]

13.6.2.5 Selection for Specific Hazards

13.6.2.5.1 Class B Fires

13.6.2.5.1.1\* Extinguishers for Pressurized Flammable Liquids and Pressurized Gas Fires

13.6.2.5.1.1.1\* Extinguishers for Pressurized Flammable Liquids and Pressurized Gas Fires

Large-capacity dry chemical extinguishers of 10 lb (4.54 kg) or greater and a discharge rate of 1 lb/sec (0.45 kg/sec) or more shall be used to protect these hazards. [10:5.5.1.1]

13.6.2.5.2 Three-Dimensional Fires

Large capacity dry chemical extinguishers of 10 lb (4.54 kg) or greater and having a discharge rate of 1 lb/sec (0.45 kg/sec) or more shall be used to protect these hazards. [10:5.5.2]

13.6.2.5.3 Obstacle Fires

Selection of a fire extinguisher for this type of hazard shall be based on one of the following:

Extinguisher containing a vapor-suppressing foam agent

\* Multiple extinguishers containing non-vapor-suppressing Class B agents intended for simultaneous application

Larger capacity extinguishers of 10 lb (4.54 kg) or greater and a minimum discharge rate of 1 lb/sec (0.45 kg/sec)

[10:5.5.3]

13.6.2.5.4 Water-Soluble Flammable Liquid Fires (Polar Solvents)

Aqueous film-forming foam (AFFF) and film-forming fluoroprotein foam (FFFP) types of fire extinguishers shall not be used for the protection of water-soluble flammable liquids, such as alcohols, acetone, esters, ketones, and so forth, unless specifically referenced on the fire extinguisher nameplate. [10:5.5.4]

13.6.2.5.5\* Class K Cooking Media Fires

Fire extinguishers provided for the protection of cooking appliances that use combustible cooking media (vegetable or animal oils and fats) shall be listed and labeled for Class K fires. [10:5.5.5]

13.6.2.5.5.1

Class K fire extinguishers manufactured after January 1, 2002, shall not be equipped with extended wand-type discharge devices. [10:5.5.5.1]

13.6.2.5.5.2

Fire extinguishers installed specifically for the protection of cooking appliances that use combustible cooking media (animal or vegetable oils and fats) without a Class K rating shall be removed from service. [10:5.5.5.2]

13.6.2.5.5.3\*

Where a hazard is protected by an automatic fire protection system, a placard shall be conspicuously placed near the extinguisher that states that the fire protection system shall be actuated prior to using the fire extinguisher. [10:5.5.5.3]

13.6.2.5.6\* Electronic Equipment Fires

Fire extinguishers for the protection of delicate electronic equipment shall be selected from types specifically listed and labeled for Class C hazards. (See 13.6.2.3.2.3.) [10:5.5.6]

13.6.2.5.6.1\*

Dry chemical fire extinguishers shall not be installed for the protection of delicate electronic equipment. [10:5.5.6.1]

13.6.2.5.7 Areas Containing Oxidizers

13.6.2.5.7.1

Only water or foam extinguishers shall be installed in areas where pool chemicals containing chlorine or bromine are stored. [10:5.5.7.1]

13.6.2.5.7.2

Multipurpose dry chemical fire extinguishers shall not be installed in areas where pool chemicals containing chlorine or bromine are stored. [10:5.5.7.2]

13.6.2.5.7.3

Fire extinguishers intended for use on oxidizer fires where oxidizers are stored or used shall be selected and installed based on the specific recommendations contained within the material's safety data sheet (SDS) for the oxidizer, surrounding conditions, and NFPA 400. [10:5.5.7.3]

13.6.2.5.8 Class D Combustible Metal Fires

Fire extinguishers or containers of Class D extinguishing agents provided for the protection of Class D fires shall be listed and labeled for Class D fires. [10:5.5.8]

13.6.2.5.8.1\*

Class D fire extinguishers and agents shall be compatible with the specific metal for which protection is provided. [10:5.5.8.1]

13.6.2.6 Selection for Specific Locations

13.6.2.6.1\*

Where portable fire extinguishers are required to be installed, the following documents shall be reviewed for the occupancies outlined in their respective scopes:

This Code

NFPA 2, Hydrogen Technologies Code

NFPA 22, Standard for Water Tanks for Private Fire Protection

NFPA 30, Flammable and Combustible Liquids Code

NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages

NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials

NFPA 40, Standard for the Storage and Handling of Cellulose Nitrate Film

NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals

NFPA 51, Standard for the Design and Installation of Oxygen—Fuel Gas Systems for Welding, Cutting, and Allied Processes

NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

NFPA 52, Vehicular Natural Gas Fuel Systems Code

NFPA 58, Liquefied Petroleum Gas Code

NFPA 59, Utility LP-Gas Plant Code

NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG)

NFPA 72, National Fire Alarm and Signaling Code

NFPA 75, Standard for the Fire Protection of Information Technology Equipment

NFPA 76, Standard for the Fire Protection of Telecommunications Facilities

NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

NFPA 99, Health Care Facilities Code

NFPA 99B, Standard for Hypobaric Facilities

NFPA 101, Life Safety Code

NFPA 102, Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures

NFPA 115, Standard for Laser Fire Protection

NFPA 120, Standard for Fire Prevention and Control in Coal Mines

NFPA 122, Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities

NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems

NFPA 140, Standard on Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations

NFPA 150, Standard on Fire and Life Safety in Animal Housing Facilities

NFPA 160, Standard for the Use of Flame Effects Before an Audience

NFPA 232, Standard for the Protection of Records

NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations

NFPA 301, Code for Safety to Life from Fire on Merchant Vessels

NFPA 302, Fire Protection Standard for Pleasure and Commercial Motor Craft

NFPA 303, Fire Protection Standard for Marinas and Boatyards

NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves

NFPA 326, Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair

NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids

NFPA 400, Hazardous Materials Code

NFPA 403, Standard for Aircraft Rescue and Fire-Fighting Services at Airports

NFPA 407, Standard for Aircraft Fuel Servicing

NFPA 408, Standard for Aircraft Hand Portable Fire Extinguishers

NFPA 409, Standard on Aircraft Hangars

NFPA 410, Standard on Aircraft Maintenance

NFPA 418, Standard for Heliports

NFPA 423, Standard for Construction and Protection of Aircraft Engine Test Facilities

NFPA 484, Standard for Combustible Metals

NFPA 495, Explosive Materials Code

NFPA 498, Standard for Safe Havens and Interchange Lots for Vehicles Transporting Explosives

NFPA 501A, Standard for Fire Safety Criteria for Manufactured Home Installations, Sites, and Communities

NFPA 502, Standard for Road Tunnels, Bridges, and Other Limited Access Highways

NFPA 505, Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations

NFPA 655, Standard for Prevention of Sulfur Fires and Explosions

NFPA 731, Standard for the Installation of Premises Security Systems

NFPA 801, Standard for Fire Protection for Facilities Handling Radioactive Materials

NFPA 804, Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants

NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants

NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities

NFPA 909, Code for the Protection of Cultural Resource Properties— Museums, Libraries, and Places of Worship

NFPA 914, Code for the Protection of Historic Structures

NFPA 1123, Code for Fireworks Display

NFPA 1125, Code for the Manufacture of Model Rocket and High Power Rocket Motors

NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience

NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas

NFPA 1192, Standard on Recreational Vehicles

NFPA 1194, Standard for Recreational Vehicle Parks and Campgrounds

NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems

NFPA 1901, Standard for Automotive Fire Apparatus

NFPA 1906, Standard for Wildland Fire Apparatus

NFPA 1925, Standard on Marine Fire-Fighting Vessels

NFPA 5000, Building Construction and Safety Code

[10:5.6.1]

13.6.2.6.2

In no case shall the requirements of the documents in 13.6.2.6.1 be less than those specified in Section 13.6 and Chapter 2. [10:5.6.2]

13.6.3 Installation of Portable Fire Extinguishers

13.6.3.1 General

13.6.3.1.1\* Number of Extinguishers

The minimum number of fire extinguishers needed to protect a property shall be determined as outlined in 13.6.3. [10:6.1.1]

13.6.3.1.1.1

The installation of extinguishers shall be independent of whether the building is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment. [10:6.1.1.1]

13.6.3.1.1.2

Additional extinguishers shall be permitted to be installed to provide more protection as necessary. [10:6.1.1.2]

13.6.3.1.1.3

Fire extinguishers having ratings less than those specified in Table 13.6.3.2.1.1 and Table 13.6.3.3.1.1 shall be permitted to be installed, provided they are not used in fulfilling the minimum protective requirements of this subsection, except as modified in 13.6.3.2.1.4, 13.6.3.2.1.5, and 13.6.3.3.1.1.1. [10:6.1.1.3]

13.6.3.1.2 Extinguisher Readiness

Portable fire extinguishers shall be maintained in a fully charged and operable condition and shall be kept in their designated places at all times when they are not being used. [10:6.1.2]

13.6.3.1.3 Placement

13.6.3.1.3.1

Fire extinguishers shall be conspicuously located where they are readily accessible and immediately available in the event of fire. [10:6.1.3.1]

13.6.3.1.3.2

Fire extinguishers shall be located along normal paths of travel, including exits from areas. [10:6.1.3.2]

13.6.3.1.3.3 Visual Obstructions

13.6.3.1.3.3.1

Fire extinguishers shall be installed in locations where they are visible except as permitted by 13.6.3.1.3.3.2. [10:6.1.3.3.1]

13.6.3.1.3.3.2\*

In rooms and in locations where visual obstructions cannot be completely avoided, signs or other means shall be provided to indicate the extinguisher location. [10:6.1.3.3.2]

13.6.3.1.3.3.3

Signs or other means used to indicate fire extinguisher location shall be located in close proximity to the extinguisher. [10:6.1.3.3.3]

13.6.3.1.3.3.4

Signs or other means used to indicate fire extinguisher location shall be visible from the normal path of travel. [10:6.1.3.3.4]

13.6.3.1.3.4\*

Portable fire extinguishers other than wheeled extinguishers shall be installed using any of the following means:

Securely on a hanger intended for the extinguisher

In a bracket incorporating releasing straps or bands supplied by the extinguisher manufacturer

In a listed bracket incorporating releasing straps or bands approved for such purpose

In approved cabinets or wall recesses

[10:6.1.3.4]

13.6.3.1.3.5

Wheeled fire extinguishers shall be located in designated locations. [10:6.1.3.5]

13.6.3.1.3.6

Fire extinguishers installed in vehicles or under other conditions where they are subject to dislodgement shall be installed in approved strap-type brackets specifically designed for this application. [10:6.1.3.6]

13.6.3.1.3.7

Fire extinguishers installed under conditions or in locations where they are subject to physical damage (e.g., from impact, vibration, the environment) shall be protected against such damage. [10:6.1.3.7]

13.6.3.1.3.8 Installation Height

13.6.3.1.3.8.1

Fire extinguishers having a gross weight not exceeding 40 lb (18.14 kg) shall be installed so that the top of the fire extinguisher is not more than 5 ft (1.53 m) above the floor. [10:6.1.3.8.1]

13.6.3.1.3.8.2

Fire extinguishers having a gross weight greater than 40 lb (18.14 kg) (except wheeled types) shall be installed so that the top of the fire extinguisher is not more than 31/2 ft (1.07 m) above the floor. [10:6.1.3.8.2]

13.6.3.1.3.8.3

In no case shall the clearance between the bottom of the hand portable fire extinguisher and the floor be less than 4 in. (102 mm). [10:6.1.3.8.3]

13.6.3.1.3.9 Label Visibility

13.6.3.1.3.9.1

Fire extinguishers shall be installed so that the fire extinguisher's operating instructions face outward. [10:6.1.3.9.1]

13.6.3.1.3.9.2

Hazardous materials identification systems (HMIS) labels, 6-year maintenance labels, hydrostatic test labels, or other labels shall not be located or placed on the front of the extinguisher. [10:6.1.3.9.2]

13.6.3.1.3.9.3

The restrictions of 13.6.3.1.3.9.2 shall not apply to the original manufacturer's labels, labels that specifically relate to the extinguisher's operation or fire classification, or inventory control labels specific to that extinguisher. [10:6.1.3.9.3]

13.6.3.1.3.10 Cabinets

13.6.3.1.3.10.1

Cabinets housing fire extinguishers shall not be locked, except where fire extinguishers are subject to malicious use and cabinets include a means of emergency access. [10:6.1.3.10.1]

13.6.3.1.3.10.2

The location of fire extinguishers as described in 13.6.3.1.3.3.2 shall be marked conspicuously. [10:6.1.3.10.2]

13.6.3.1.3.10.3

Fire extinguishers mounted in cabinets or wall recesses shall be placed so that the fire extinguisher's operating instructions face outward. [10:6.1.3.10.3]

13.6.3.1.3.10.4\*

Where fire extinguishers are installed in closed cabinets that are exposed to elevated temperatures, the cabinets shall be provided with screened openings and drains. [10:6.1.3.10.4]

13.6.3.1.3.10.5

Cabinets or wall recesses for fire extinguishers shall be installed such that the extinguisher mounting heights specified in 13.6.3.1.3.8.1 and 13.6.3.1.3.8.2 are met. [10:6.1.3.10.5]

13.6.3.1.3.10.6\*

For fire resistance-rated walls, only surface-mounted cabinets or listed fire-rated cabinets shall be installed. [10:6.1.3.10.6]

13.6.3.1.3.11\*

Fire extinguishers shall not be exposed to temperatures outside of the listed temperature range shown on the fire extinguisher label. [10: 6.1.3.11]

13.6.3.1.4 Antifreeze

13.6.3.1.4.1

Fire extinguishers containing only plain water shall be protected to temperatures as low as —40°F (—40°C) by the addition of an antifreeze that is stipulated on the fire extinguisher nameplate. [10:6.1.4.1]

13.6.3.1.4.2

Calcium chloride solutions shall not be used in stainless steel fire extinguishers. [10:6.1.4.2]

13.6.3.1.5 Electronic Monitoring and Alarm System

13.6.3.1.5.1

The connection to the electronic monitoring device shall be continuously supervised for integrity. [10:6.1.5.1]

13.6.3.1.5.2

The power source for the electronic monitoring device shall be supervised for continuity of power. [10:6.1.5.2]

13.6.3.2 Installations for Class A Hazards

13.6.3.2.1 Fire Extinguisher Size and Placement for Class A Hazards

13.6.3.2.1.1

Minimal sizes of fire extinguishers for the listed grades of hazards shall be provided on the basis of Table 13.6.3.2.1.1, except as modified by 13.6.3.2.1.4 and 13.6.3.2.1.5. [10:6.2.1.1]

Table 13.6.3.2.1.1 Fire Extinguisher Size and Placement for Class A Hazards

Criteria

Light Hazard

Occupancy

Ordinary

Hazard

Occupancy

Extra

Hazard

Occupancy

Minimum rated single

extinguisher

2-A

2-A

4-A

Maximum floor area

per unit of A

3000 ft2

1500 ft2

1000 ft2

Maximum floor area

per extinguisher

11,250 ft2

11,250 ft2

11,250 ft2

Maximum travel

distance to

extinguisher

75 ft

75 ft

75 ft

For SI units, 1 ft = 0.305 m; 1 ft2 = 0.0929 m2.

Note: For maximum floor area explanations, see E.3.3 of NFPA 10.

[10:Table 6.2.1.1]

13.6.3.2.1.2

The minimum number of extinguishers for Class A hazards shall be sufficient to meet the requirements of 13.6.3.2.1.2.1 through 13.6.3.2.1.2.3. [10:6.2.1.2]

13.6.3.2.1.2.1

The minimum number of fire extinguishers for Class A hazards for each floor of a building shall be determined by dividing the total floor area by the maximum area to be protected per extinguisher as determined by Table 13.6.3.2.1.1. (See Annex E of NFPA 10.) [10:6.2.1.2.1]

13.6.3.2.1.2.2

Fire extinguishers shall be located so that the maximum travel distances shall not exceed 75 ft(22.9 m), except as modified by 13.6.3.2.1.4. [10:6.2.1.2.2]

13.6.3.2.1.2.3

Where the quantity of extinguishers required to satisfy 13.6.3.2.1.2.2 exceeds the number calculated in 13.6.3.2.1.2.1, additional extinguishers shall be installed. [10:6.2.1.2.3]

13.6.3.2.1.3

Smaller fire extinguishers that are rated on Class B and Class C fires but do not have a minimum 1-A rating shall not be used to meet the requirements of 13.6.3.2.1. [10:6.2.1.3]

13.6.3.2.1.4

Fire extinguishers of lesser rating shall be permitted to be installed but shall not be considered as fulfilling any part of the requirements of Table 13.6.3.2.1.1, except as permitted in 13.6.3.2.1.4.1 and 13.6.3.2.1.4.2. [10:6.2.1.3.1]

13.6.3.2.1.4.1

Up to two water-type extinguishers, each with 1-A rating, shall be permitted to be used to fulfill the requirements of one 2-A rated extinguisher. [10:6.2.1.3.1.1]

13.6.3.2.1.4.2

Two 21/2 gal (9.46 L) water-type extinguishers shall be permitted to be used to fulfill the requirements of one 4-A rated extinguisher. [10:6.2.1.3.1.2]

13.6.3.2.1.5

Up to one-half of the complement of fire extinguishers specified in Table 13.6.3.2.1.1 shall be permitted to be replaced by uniformly spaced 11/2 in. (38 mm) hose stations for use by the occupants of the building. [10:6.2.1.4]

13.6.3.2.1.5.1

Where hose stations are so provided, they shall conform to NFPA 14. [10:6.2.1.4.1]

13.6.3.2.1.5.2

The location of hose stations and the placement of fire extinguishers shall be such that the hose stations do not replace more than every other fire extinguisher. [10:6.2.1.4.2]

13.6.3.2.1.6

Where the area of the floor of a building is less than that specified in Table 13.6.3.2.1.1, at least one fire extinguisher of the minimum size required shall be provided. [10:6.2.1.5]

13.6.3.2.1.7

The protection requirements shall be permitted to be fulfilled with fire extinguishers of higher rating, provided the travel distance to such larger fire extinguishers does not exceed 75 ft (22.9 m) and the maximum floor area per unit of A is not exceeded. [10:6.2.1.6]

13.6.3.3 Installations for Class B Hazards

13.6.3.3.1 Spill Fires

13.6.3.3.1.1

Minimum ratings of fire extinguishers for the listed grades of hazard shall be provided in accordance with Table 13.6.3.3.1.1. [10:6.3.1.1]

Table 13.6.3.3.1.1 Fire Extinguisher Size and Placement for Class B Hazards

Type of Hazard

Basic Minimum

Extinguisher

Rating

Maximum Travel Distance

to Extinguishers

ft

m

Light

5-B

30

9.14

10-B

50

15.25

Ordinary

10-B

30

9.14

20-B

50

15.25

Extra

40-B

30

9.14

80-B

50

15.25

Note:

The specified ratings do not imply that fires of the magnitudes indicated by these ratings will occur, but rather they are provided to give the operators more time and agent to handle difficult spill fires that have the potential to occur.

[10: Table 6.3.1.1]

13.6.3.3.1.1.1

Two or more fire extinguishers of lower rating shall not be used to fulfill the protection requirements of Table 13.6.3.3.1.1 except as permitted by 13.6.3.3.1.1.2 and 13.6.3.3.1.1.3. [10:6.3.1.1.1]

13.6.3.3.1.1.2

Up to three AFFF or FFFP fire extinguishers of at least 21/2 gal (9.46 L) capacity shall be permitted to be used to fulfill extra hazard requirements. [10:6.3.1.1.2]

13.6.3.3.1.1.3

Two AFFF or FFFP fire extinguishers of at least 1.6 gal (6 L) capacity shall be permitted to be used to fulfill ordinary hazard requirements. [10:6.3.1.1.3]

13.6.3.3.1.2

Fire extinguishers of lesser rating, designed for small specific hazards within the general hazard area, shall be permitted to be installed but shall not be considered as fulfilling any part of the requirements of Table 13.6.3.3.1.1, unless permitted by 13.6.3.3.1.1.1 or 13.6.3.3.1.1.2. [10:6.3.1.2]

13.6.3.3.1.3

Fire extinguishers shall be located so that the maximum travel distances do not exceed those specified in Table 13.6.3.3.1.1. [10:6.3.1.3]

13.6.3.3.1.4

The protection requirements shall be permitted to be fulfilled with fire extinguishers of higher ratings, provided the travel distance to such larger fire extinguishers does not exceed 50 ft (15.25 m). [10:6.3.1.4]

13.6.3.3.2 Flammable Liquids of Appreciable Depth

13.6.3.3.2.1

Portable fire extinguishers shall not be installed as the sole protection for flammable liquid hazards of appreciable depth where the surface area exceeds 10 ft2 (0.93 m2). [10:6.3.2.1]

13.6.3.3.2.2\*

Where personnel who are trained in extinguishing fires in the protected hazards are located on the premises and capable of responding immediately, the maximum surface area shall not exceed 20 ft2 (1.86 m2). [10:6.3.2.2]

13.6.3.3.2.3

For flammable liquid hazards of appreciable depth, a Class B fire extinguisher shall be provided on the basis of at least 2 numerical units of Class B extinguishing potential per 1 ft2 (0.09 m2) of flammable liquid surface of the largest hazard area. [10:6.3.2.3]

13.6.3.3.2.4

AFFF- or FFFP-type fire extinguishers shall be permitted to be provided on the basis of 1-B of protection per 1 ft2 (0.09 m2) of hazard. (For fires involving water-soluble flammable liquids, see 5.5.3 of NFPA 10.) [10:6.3.2.4]

13.6.3.3.2.5

Two or more fire extinguishers of lower ratings, other than AFFF- or FFFP-type fire extinguishers, shall not be used in lieu of the fire extinguisher required for the largest hazard area. [10:6.3.2.5]

13.6.3.3.2.6

Up to three AFFF- or FFFP-type fire extinguishers shall be permitted to fulfill the requirements, provided the sum of the Class B ratings meets or exceeds the value required for the largest hazard area. [10:6.3.2.6]

13.6.3.3.2.7

Travel distances for portable fire extinguishers shall not exceed 50 ft (15.25 m). (See Annex E of NFPA 10.) [10:6.3.2.7]

13.6.3.3.2.7.1

Scattered or widely separated hazards shall be individually protected. [10:6.3.2.7.1]

13.6.3.3.2.7.2

A fire extinguisher in the proximity of a hazard shall be located to be accessible in the presence of a fire without undue danger to the operator. [10:6.3.2.7.2]

13.6.3.3.3 Obstacle, Gravity/Three-Dimensional, and Pressure Fire Hazards

13.6.3.3.3.1

Where hand portable fire extinguishers are installed or positioned for obstacle, gravity/three-dimensional, or pressure fire hazards, the actual travel distance to hazard shall not exceed 30 ft (9 m) unless otherwise specified (See 5.6.1 of NFPA 10.) [10:6.3.3.1]

13.6.3.3.3.2

Where wheeled fire extinguishers of 125 lb (56.7 kg) agent capacity or larger are installed or positioned for obstacle, gravity/three-dimensional, or pressure fire hazards, the actual travel distance to hazard shall not exceed 100 ft (30.5 m) unless otherwise specified. (See 5.6.1 of NFPA 10.) [10:6.3.3.2]

13.6.3.4\* Installations for Class C Hazards

13.6.3.4.1

Fire extinguishers with Class C ratings shall be required where energized electrical equipment can be encountered. [10:6.4.1]

13.6.3.4.2

The requirement in 13.6.3.4.1 shall include situations where fire either directly involves or surrounds electrical equipment. [10:6.4.2]

13.6.3.4.3

Because fire is a Class A or Class B hazard, the fire extinguishers shall be sized and located on the basis of the anticipated Class A or Class B hazard. [10:6.4.3]

13.6.3.5 Installations for Class D Hazards

13.6.3.5.1\*

Fire extinguishers or extinguishing agents with Class D ratings shall be provided for fires involving combustible metals. [10:6.5.1]

13.6.3.5.2

Fire extinguishers or extinguishing agents (media) shall be located not more than 75 ft (22.9 m) of travel distance from the Class D hazard. (See Section E.6 of NFPA 10.) [10:6.5.2]

13.6.3.5.3\*

Portable fire extinguishers or extinguishing agents (media) for Class D hazards shall be provided in those work areas where combustible metal powders, flakes, shavings, chips, or similarly sized products are generated. [10:6.5.3]

13.6.3.5.4\*

Size determination shall be on the basis of the specific combustible metal, its physical particle size, area to be covered, and recommendations by the fire extinguisher manufacturer based on data from control tests. [10:6.5.4]

13.6.3.6 Installations for Class K Hazards

13.6.3.6.1

Class K fire extinguishers shall be provided for hazards where there is a potential for fires involving combustible cooking media (vegetable or animal oils and fats). [10:6.6.1]

13.6.3.6.2

Maximum travel distance shall not exceed 30 ft (9.1 m) from the hazard to the extinguishers. [10:6.6.2]

13.6.3.6.3

All solid fuel cooking appliances (whether or not under a hood) with fire boxes of 5 ft3 (0.14 m3) volume or less shall have at least a listed 2-A rated water-type fire extinguisher or a 1.6 gal (6 L) wet chemical fire extinguisher that is listed for Class K fires. [10:6.6.3]

13.6.4 Inspection, Maintenance, and Recharging

13.6.4.1\* General

13.6.4.1.1 Responsibility

The owner or designated agent or occupant of a property in which fire extinguishers are located shall be responsible for inspection, maintenance, and recharging. (See 13.6.4.1.2.) [10:7.1.1]

13.6.4.1.2 Personnel

13.6.4.1.2.1\*

Persons performing maintenance and recharging of extinguishers shall be certified. [10:7.1.2.1]

13.6.4.1.2.1.1

Persons training to become certified shall be permitted to perform maintenance and recharging of extinguishers under the direct supervision and in the immediate presence of a certified person. [10:7.1.2.1.1]

13.6.4.1.2.1.2

Certification requires that a person pass a test administered by an organization acceptable to the AH]. [10:7.1.2.1.2]

13.6.4.1.2.1.3

The test shall, at a minimum, be based upon knowledge of the chapters and annexes of NFPA 10. [10:7.1.2.1.3]

13.6.4.1.2.1.4

The testing process shall permit persons to use NFPA 10 during the test. [10:7.1.2.1.4]

13.6.4.1.2.1.5

Persons passing the test required in 13.6.4.1.2.1.2 shall be issued a document or a certificate. [10:7.1.2.1.5]

13.6.4.1.2.1.6

The document or certificate shall be made available when requested by the AHJ. [10:7.1.2.1.6]

13.6.4.1.2.2\*

Persons performing maintenance and recharging of extinguishers shall be trained and shall have available the appropriate manufacturer's servicing manual(s), the correct tools, recharge materials, lubricants, and manufacturer's replacement parts or parts specifically listed for use in the fire extinguisher. [10:7.1.2.2]

13.6.4.1.2.3\*

Persons performing inspections shall not be required to be certified. [10:7.1.2.3]

13.6.4.1.3 Replacement While Servicing

Fire extinguishers removed from service for maintenance or recharging shall be replaced by a fire extinguisher suitable for the type of hazard being protected and shall be of at least equal rating. [10:7.1.3]

13.6.4.1.4 Tags or Labels

13.6.4.1.4.1

Tags or labels intended for recording inspections, maintenance, or recharging shall be affixed so as not to obstruct the fire extinguisher use, fire extinguisher classification, or manufacturer's labels. [10:7.1.4.1]

13.6.4.1.4.2

Labels indicating fire extinguisher use or classification or both shall be permitted to be placed on the front of the fire extinguisher. [10:7.1.4.2]

13.6.4.2 Inspection

13.6.4.2.1 Inspection Frequency

13.6.4.2.1.1\*

Fire extinguishers shall be manually inspected when initially placed in service. [10:7.2.1.1]

13.6.4.2.1.2\*

Fire extinguishers and Class D extinguishing agents shall be inspected either manually or by means of an electronic monitoring device/system at intervals not exceeding 31 days. [10:7.2.1.2]

13.6.4.2.1.2.1

Fire extinguishers and Class D extinguishing agents shall be inspected at least once per calendar month. [10:7.2.1.2.1]

13.6.4.2.1.3\*

Fire extinguishers and Class D extinguishing agents shall be manually inspected daily or weekly when conditions exist that indicate the need for more frequent inspections. [10:7.2.1.3]

13.6.4.2.1.4

Extinguishers that are electronically monitored for location only, such as those monitored by means of a switch to indicate when the extinguisher is removed from its bracket or cabinet, shall be manually inspected in accordance with 13.6.4.2.2. [10:7.2.1.4]

13.6.4.2.2 Inspection Procedures

Periodic inspection or electronic monitoring of fire extinguishers shall include a check of at least the following items:

Location in designated place

Visibility of the extinguisher or means of indicating the extinguisher location

Access to the extinguisher

Pressure gauge reading or indicator in the operable range or position

Fullness determined by weighing or hefting

Condition of tires, wheels, carriage, hose, and nozzle for wheeled extinguishers

Indicator for nonrechargeable extinguishers using push-to-test pressure indicators

[10:7.2.2]

13.6.4.2.2.1

The owner or the owner's agent shall determine the method of extinguisher inspection such as manual inspection, electronic monitoring, or any combination of the two. [10:7.2.2.1]

13.6.4.2.2.2

Any method(s) of inspection other than manual inspection shall require the approval of the authority having jurisdiction. [10:7.2.2.2]

13.6.4.2.2.3\*

In addition to 13.6.4.2.2, fire extinguishers shall be visually inspected in accordance with 13.6.4.2.2.4 if they are located where any of the following conditions exists:

High frequency of fires in the past

Severe hazards

Locations that make fire extinguishers susceptible to mechanical injury or physical damage

Exposure to abnormal temperatures or corrosive atmospheres

[10:7.2.2.3]

13.6.4.2.2.4

Where required by 13.6.4.2.2.3, the following inspection procedures shall be in addition to those addressed in 13.6.4.2.2:

Verify that operating instructions on nameplates are legible and face outward

Check for broken or missing safety seals and tamper indicators

Examine for obvious physical damage, corrosion, leakage, or clogged nozzle

[10:7.2.2.4]

13.6.4.2.2.5 Inspection Procedure for Containers of Class D Extinguishing Agent

Periodic inspection of containers of Class D extinguishing agent used to protect Class D hazards shall include verification of at least the following:

Located in designated place

Visibility of the container or means of indicating the container location

Access to the container

Lid is sealed

Fullness by hefting or weighing

No obvious physical damage to container

[10:7.2.2.5]

13.6.4.2.3 Corrective Action

When an inspection of any fire extinguisher reveals a deficiency in any of the conditions in 13.6.4.2.2 or 13.6.4.2.2.4, immediate corrective action shall be taken. [10:7.2.3]

13.6.4.2.3.1 Rechargeable Fire Extinguishers

When an inspection of any rechargeable fire extinguisher reveals a deficiency in any of the conditions in 13.6.4.2.2(3), 13.6.4.2.2(4), 13.6.4.2.2(5), or 13.6.4.2.2(1) through 13.6.4.2.2(3), the extinguisher shall be subjected to applicable maintenance procedures. [10:7.2.3.1]

13.6.4.2.3.2 Nonrechargeable Dry Chemical Fire Extinguisher

When an inspection of any nonrechargeable dry chemical fire extinguisher reveals a deficiency in any of the conditions listed in 13.6.4.2.2(3), 13.6.4.2.2(4),13.6.4.2.2(6), or 13.6.4.2.2.4(1) through 13.6.4.2.2.4(3), the extinguisher shall be removed from further use, discharged, and destroyed at the direction of the owner or returned to the manufacturer. [10:7.2.3.2]

13.6.4.2.3.3 Nonrechargeable Halon Agent Fire Extinguisher

When an inspection of any nonrechargeable fire extinguisher containing a halon agent reveals a deficiency in any of the conditions listed in 13.6.4.2.2(3), 13.6.4.2.2(4), 13.6.4.2.2(6), or 13.6.4.2.2.4(1) through 13.6.4.2.2.4(3), the extinguisher shall be removed from service, shall not be discharged, and shall be returned to the manufacturer, a fire equipment dealer, or a distributor to permit recovery of the halon. [10:7.2.3.3]

13.6.4.2.4 Inspection Record Keeping

13.6.4.2.4.1 Manual Inspection Records

13.6.4.2.4.1.1

Where manual inspections are conducted, records for manual inspections shall be kept on a tag or label attached to the fire extinguisher, on an inspection checklist maintained on file, or by an electronic method. [10:7.2.4.1.1]

13.6.4.2.4.1.2

Where manual inspections are conducted, the month and year the manual inspection was performed and the initials of the person performing the inspection shall be recorded. [10:7.2.4.1.2]

13.6.4.2.4.1.3

Personnel making manual inspections shall keep records of all fire extinguishers inspected, including those found to require corrective action. [10:7.2.4.1.3]

13.6.4.2.4.1.4

Records for manual inspection shall be kept to demonstrate that at least the last 12 monthly inspections have been performed. [10:7.2.4.1.4]

13.6.4.2.4.2 Electronic Inspection Records

13.6.4.2.4.2.1

Where electronically monitored systems are employed for inspections, records shall be kept for fire extinguishers found to require corrective action. [10:7.2.4.2.1]

13.6.4.2.4.2.2

Records for electronic monitoring shall be kept to demonstrate that at least the last 12 monthly inspections have been performed. [10:7.2.4.2.2]

13.6.4.2.4.2.3

For electronically monitored fire extinguishers, where the extinguisher causes a signal at a control unit when a deficiency in any of the conditions listed in 13.6.4.2.2 occurs, record keeping shall be provided in the form of an electronic event log at the control panel. [10:7.2.4.2.3]

13.6.4.3 Extinguisher Maintenance

13.6.4.3.1 Maintenance Procedures

Where required by another section of this Code or NFPA 10, maintenance procedures shall include the procedures detailed in the manufacturer's service manual and a thorough examination of the basic elements of the fire extinguisher, including the following:

Mechanical parts of all fire extinguishers

Extinguishing agent

Expelling means

Physical condition

[10:7.3.1]

13.6.4.3.2\* Annual Maintenance Record Keeping

13.7 Detection, Alarm, and Communications Systems

13.7.1 General

13.7.1.1

Where building fire alarm systems or automatic fire detectors are required by other sections of this Code, they shall be provided and installed in accordance with NFPA 70, NFPA 72, and Section 13.7.

13.7.1.2\* Building Alarm and Signaling Systems

Protected premises systems that serve the alarm and signaling needs of a building or buildings shall include one or more of the following systems or functions:

Manual fire alarm signal initiation

Automatic fire alarm and supervisory signal initiation

Monitoring of abnormal conditions in fire suppression systems

Actuation of fire suppression systems

Actuation of emergency control functions

Actuation of fire alarm notification appliances

In-building fire emergency voice/alarm communications

Automatic carbon monoxide alarm and supervisory signal initiation

Actuation of carbon monoxide notification appliances

Guard's tour supervisory service

Process monitoring supervisory systems

Actuation of off-premises signals

Combination systems

[72:23.3.3.1]

13.7.1.3

All apparatus requiring rewinding or resetting to maintain normal operation shall be rewound or reset as promptly as possible after each test and alarm. [72:14.5.4]

13.7.1.4

The provisions of Section 13.7 shall apply only where specifically required by another section of this Code. [101:9.6.1.1]

13.7.1.4.1

Fire detection, alarm, and communications systems installed to make use of an alternative permitted by this Code shall be considered required systems and shall meet the provisions of this Code applicable to required systems. [101:9.6.1.2]

13.7.1.4.2\*

To ensure operational integrity, the fire alarm system shall have an approved maintenance and testing program complying with the applicable requirements of NFPA 70 and NFPA 72. [101:9.6.1.5]

13.7.1.4.3

Fire alarm system impairment procedures shall comply with NFPA 72. [101:9.6.1.6]

13.7.1.5\* Impaired and Nuisance Alarm Prone Systems

13.7.1.5.1

Impaired fire alarm systems shall include, but shall not be limited to, required systems that are not fully operational, are no longer monitored as required by the AHJ, or are under renovation or repair.

13.7.1.5.2

The system owner or designated representative shall immediately notify the AHJ in an approved manner when a fire alarm system is impaired.

13.7.1.5.3

The AHJ shall be authorized to require standby fire personnel or an approved fire watch in accordance with 1.7.16 at premises in which required fire alarm systems are impaired or classified as chronic nuisance alarm prone systems.

13.7.1.5.4

Fire alarm systems that have produced five or more nuisance alarms in a 365-day period shall be classified as chronic nuisance alarm prone systems.

13.7.1.5.5\*

The AHJ shall be authorized to require central station service be provided for chronic nuisance alarm prone systems.

13.7.1.5.6\*

Fire alarm supervising stations and fire alarm service companies shall immediately notify the AHJ when any of the following conditions exists:

A fire alarm system is impaired.

Required system monitoring is no longer being provided.

Required testing, service, and maintenance is no longer being provided.

A fire alarm system cannot be serviced or repaired to make it fully operational.

A fire alarm system cannot be serviced or repaired to eliminate chronic nuisance alarms.

13.7.1.5.7

The system owner shall replace required fire alarm systems that cannot be serviced or repaired to eliminate system impairments or chronic nuisance alarms.

13.7.1.6\* Nonrequired Coverage

13.7.1.6.1

Detection installed for reasons of achieving specific fire safety objectives, but not required by any laws, codes, or standards, shall meet all of the requirements of this Code, with the exception of prescriptive spacing criteria of Chapter 17 of NFPA 72. [72:17.5.3.3.1]

13.7.1.6.2

Where nonrequired detectors are installed for achieving specific fire safety objectives, additional detectors not necessary to achieve the objectives shall not be required. [72:17.5.3.3.2]

13.7.1.7 Signal Initiation

13.7.1.7.1

Where required by other sections of this Code, actuation of the fire alarm system shall occur by any or all of the following means of initiation but shall not be limited to such means:

Manual fire alarm initiation

Automatic detection

Extinguishing system operation

[101:9.6.2.1]

13.7.1.7.2

Manual fire alarm boxes shall be used only for fire-protective signaling purposes. Combination fire alarm and guard's tour stations shall be permitted. [101:9.6.2.2]

13.7.1.7.3

A manual fire alarm box shall be provided as follows, unless modified by another section of this Code:

For new alarm system installations, the manual fire alarm box shall be located within 60 in. (1525 mm) of exit doorways.

For existing alarm system installations, the manual fire alarm box either shall be provided in the natural exit access path near each required exit or within 60 in. (1525 mm) of exit doorways.

[101:9.6.2.3]

13.7.1.7.4

Manual fire alarm boxes shall be mounted on both sides of grouped openings over 40 ft (12.2 m) in width, and within 60 in. (1525 mm) of each side of the opening. [101:9.6.2.4]

13.7.1.7.5\*

Additional manual fire alarm boxes shall be located so that, on any given floor in any part of the building, no horizontal distance on that floor exceeding 200 ft (61 m) shall need to be traversed to reach a manual fire alarm box. [101:9.6.2.5]

13.7.1.7.6\*

For fire alarm systems using automatic fire detection or waterflow detection devices to initiate the fire alarm system in accordance with Chapters 11 through 43 of NFPA 101, not less than one manual fire alarm box, located as required by the AHJ, shall be provided to initiate a fire alarm signal. [101:9.6.2.6]

13.7.1.7.7\*

Manual fire alarm boxes shall be accessible, unobstructed, and visible. [101:9.6.2.7]

13.7.1.7.8

Where a sprinkler system provides automatic detection and alarm system initiation, it shall be provided with an approved alarm initiation device that operates when the flow of water is equal to or greater than that from a single automatic sprinkler. [101:9.6.2.8]

13.7.1.7.9

Where a total (complete) coverage smoke detection system is required by another section of this Code, automatic detection of smoke in accordance with NFPA 72 shall be provided in all occupiable areas in environments that are suitable for proper smoke detector operation. [101:9.6.2.9]

13.7.1.8 Smoke Alarms

13.7.1.8.1

Where required by another section of this Code, single-station and multiple-station smoke alarms shall be in accordance with NFPA 72 unless otherwise provided in 13.7.1.8.4, 13.7.1.8.5.4, 13.7.1.8.5.7, or 13.7.1.8.6. [101:9.6.2.10.1]

13.7.1.8.2

Where automatic smoke detection is required by Chapters 11 through 43 of NFPA 101, smoke alarms shall not be used as a substitute. [101:9.6.2.10.2]

13.7.1.8.3 Smoke Alarms in Sleeping Rooms

13.7.1.8.3.1

In new construction, where required by Chapters 11 through 43, the alarm notification signal in sleeping rooms resulting from activation of smoke alarms shall be a 520 Hz low-frequency signal complying with NFPA 72. [101:9.6.2.10.3.1]

13.7.1.8.4\*

The interconnection of smoke alarms shall apply only to new construction as provided in 13.7.1.8.8. [101:9.6.2.10.4]

13.7.1.8.5 Specific Location Requirements

The installation of smoke alarms and smoke detectors shall comply with 13.7.1.8.5.1 through 13.7.1.8.5.14. [72:29.11.3.4]

13.7.1.8.5.1

Smoke alarms and smoke detectors shall not be located where ambient conditions, including humidity and temperature, are outside the limits specified by the manufacturer's published instructions. [72:29.11.3.4(1)]

13.7.1.8.5.2

Smoke alarms and smoke detectors shall not be located within unfinished attics or garages or in other spaces where temperatures can fall below 40°F (4.4°C) or exceed 100°F (38°C). [72:29.11.3.4(2)]

13.7.1.8.5.3\*

Where the mounting surface could become considerably warmer or cooler than the room, such as a poorly insulated ceiling below an unfinished attic or an exterior wall, smoke alarms and smoke detectors shall be mounted on an inside wall. [72:29.11.3.4(3)]

13.7.1.8.5.4\*

Smoke alarms and smoke detectors shall not be installed within an area of exclusion determined by a 10 ft (3.0 m) radial distance along a horizontal flow path from a stationary or fixed cooking appliance, unless listed for installation in close proximity to cooking appliances. Smoke alarms and smoke detectors installed between 10 ft (3.0 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be equipped with an alarm-silencing means or use photoelectric detection. [72:29.11.3.4(4)]

13.7.1.8.5.5

Smoke alarms or smoke detectors that use photoelectric detection shall be permitted for installation at a radial distance greater than 6 ft (1.8 m) from any stationary or fixed cooking appliance when the following conditions are met:

The kitchen or cooking area and adjacent spaces have no clear interior partitions or headers

The 10 ft (3.0 m) area of exclusion would prohibit the placement of a smoke alarm or smoke detector required by other sections of NFPA 72.

[72:29.11.3.4(5)]

13.7.1.8.5.6

Effective January 1, 2022, smoke alarms and smoke detectors installed between 6 ft (1.8 m) and 20 ft (6.1 m) along a horizontal flow path from a stationary or fixed cooking appliance shall be listed for resistance to common nuisance sources from cooking. [72:29.11.3.4(6)]

13.7.1.8.5.7

Diagram

Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from a door to a bathroom containing a shower or tub unless listed for installation in close proximity to such locations. [72:29.11.3.4(7)]

UpCodes Diagrams

P

Smoke Alarms: Story Locations (IRC)

13.7.1.8.5.8

Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from the supply registers of a forced air heating or cooling system and shall be installed outside of the direct airflow from those registers. [72:29.11.3.4(8)]

13.7.1.8.5.9

Smoke alarms and smoke detectors shall not be installed within a 36 in. (910 mm) horizontal path from the tip of the blade of a ceiling-suspended (paddle) fan unless the room configuration restricts meeting this requirement. [72:29.11.3.4(9)]

13.7.1.8.5.10

Where stairs lead to other occupiable levels, a smoke alarm or smoke detector shall be located so that smoke rising in the stairway cannot be prevented from reaching the smoke alarm or smoke detector by an intervening door or obstruction. [72:29.11.3.4(10)]

13.7.1.8.5.11

For stairways leading up from a basement, smoke alarms or smoke detectors shall be located on the basement ceiling near the entry to the stairs. [72:29.11.3.4(11)]

13.7.1.8.5.12

For tray-shaped ceilings (coffered ceilings), smoke alarms and smoke detectors shall be installed on the highest portion of the ceiling or on the sloped portion of the ceiling within 12 in. (300 mm) vertically down from the highest point. [72:29.11.3.4(12)]

13.7.1.8.5.13

Smoke alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 13.7.4.3.3.4. [72:29.11.3.4(13)]

13.7.1.8.5.14

Heat alarms and detectors installed in rooms with joists or beams shall comply with the requirements of 17.6.3 of NFPA 72. [72:A.29.11.3.4(14)]

13.7.1.8.6

System smoke detectors in accordance with NFPA 72 and arranged to function in the same manner as single-station or multiple-station smoke alarms shall be permitted in lieu of smoke alarms. [101:9.6.2.10.8]

13.7.1.8.7

Smoke alarms, other than battery-operated smoke alarms as permitted by other sections of this Code, shall be powered in accordance with the requirements of NFPA 72. [101:9.6.2.10.9]

13.7.1.8.8\*

In new construction, where two or more smoke alarms are required within a dwelling unit, suite of rooms, or similar area, they shall be arranged so that operation of any smoke alarm shall cause the alarm in all smoke alarms within the dwelling unit, suite of rooms, or similar area to sound, unless otherwise permitted by one of the following:

The requirement of 13.7.1.8.8 shall not apply where permitted by another section of this Code.

The requirement of 13.7.1.8.8 shall not apply to configurations that provide equivalent distribution of the alarm signal.

[101:9.6.2.10.10]

13.7.1.8.9

The alarms described in 13.7.1.8.8 shall sound only within an individual dwelling unit, suite of rooms, or similar area and shall not actuate the building fire alarm system, unless otherwise permitted by the AHJ. [101:9.6.2.10.11]

13.7.1.8.10

Smoke alarms shall be permitted to be connected to the building fire alarm system for the purpose of annunciation in accordance with NFPA 72. [101:9.6.2.10.12]

13.7.1.9 Occupant Notification

13.7.1.9.1

Occupant notification shall be provided to alert occupants of a fire or other emergency where required by other sections of this Code. [101:9.6.3.1]

13.7.1.9.2

Occupant notification shall be in accordance with 13.7.1.9.4 through 13.7.1.9.11.2, unless otherwise provided in 13.7.1.9.2.1 through 13.7.1.9.2.4. [101:9.6.3.2]

13.7.1.9.2.1\*

Elevator lobby, hoistway, and associated machine room smoke detectors used solely for elevator recall, and heat detectors used solely for elevator power shutdown, shall not be required to activate the building evacuation alarm if the power supply and installation wiring to such detectors are monitored by the building fire alarm system, and if the activation of such detectors initiates a supervisory signal at a constantly attended location. [101:9.6.3.2.1]

13.7.1.9.2.2\*

Smoke detectors used solely for closing dampers or heating, ventilating, and air-conditioning system shutdown shall not be required to activate the building evacuation alarm, provided that the power supply and installation wiring to the detectors are monitored by the building fire alarm system, and the activation of the detectors initiates a supervisory signal at a constantly attended location. [101:9.6.3.2.2]

13.7.1.9.2.3\*

Smoke detectors located at doors for the exclusive operation of automatic door release shall not be required to activate the building evacuation alarm, provided that the power supply and installation wiring to the detectors are monitored by the building fire alarm system, and the activation of the detectors initiates a supervisory signal at a constantly attended location. [101:9.6.3.2.3]

13.7.1.9.2.4

Detectors in accordance with 22.3.4.3.1(2) and 23.3.4.3.1(2) of NFPA 101 shall not be required to activate the building evacuation alarm. [101:9.6.3.2.4]

13.7.1.9.3

Where required by Chapters 11 through 43 of NFPA 101, the audible alarm notification signal provided in sleeping rooms resulting from the activation of the fire alarm system or sleeping room smoke detector shall be a 520 Hz low-frequency signal complying with NFPA 72. [101:9.6.3.3]

13.7.1.9.4

Where permitted by Chapters 11 through 43 of NFPA 101, a presignal system shall be permitted where the initial fire alarm signal is automatically transmitted without delay to a municipal fire department, to a fire brigade (if provided), and to an on-site staff person trained to respond to a fire emergency. [101:9.6.3.4]

13.7.1.9.5

Where permitted by Chapters 11 through 43 of NFPA 101, a positive alarm sequence shall be permitted, provided that it is in accordance with NFPA 72. [101:9.6.3.5]

13.7.1.9.6

Unless otherwise provided in 13.7.1.9.6.1 through 13.7.1.9.6.8, notification signals for occupants to evacuate shall be by audible and visible signals in accordance with NFPA 72 and ICC A117.1, Accessible and Usable Buildings and Facilities, or other means of notification acceptable to the AHJ. [101:9.6.3.6]

13.7.1.9.6.1

Areas not subject to occupancy by persons who are hearing impaired shall not be required to comply with the provisions for visible signals. [101:9.6.3.6.1]

13.7.1.9.6.2

Visible-only signals shall be provided where specifically permitted in health care occupancies in accordance with Chapters 18 and 19 of NFPA 101. [101:9.6.3.6.2]

13.7.1.9.6.3

Existing alarm systems shall not be required to comply with the provision for visible signals. [101:9.6.3.6.3]

13.7.1.9.6.4

Visible signals shall not be required in lodging or rooming houses in accordance with Chapter 26 of NFPA 101. [101:9.6.3.6.4]

13.7.1.9.6.5

Visible signals shall not be required in exit stair enclosures. [101:9.6.3.6.5]

13.7.1.9.6.6

Visible signals shall not be required in elevator cars. [101:9.6.3.6.6]

13.7.1.9.6.7\*

Public mode visual notification appliances in accordance with NFPA 72 shall not be required in designated areas as permitted by Chapters 11 through 43 of NFPA 101, provided that they are replaced with approved alternative visible means. [101:9.6.3.6.7]

13.7.1.9.6.8\*

Where visible signals are not required, as permitted by 13.7.1.9.6.7, documentation of such omission shall be maintained in accordance with 9.13.3 of NFPA 101. [101:9.6.3.6.8]

13.7.1.9.7

The general evacuation alarm signal shall operate in accordance with one of the methods prescribed by 13.7.1.9.7.1 through 13.7.1.9.7.3. [101:9.6.3.7]

13.7.1.9.7.1

The general evacuation alarm signal shall operate throughout the entire building other than the locations described in 13.7.1.9.7.4 and 13.7.1.9.7.5. [101:9.6.3.7.1]

13.7.1.9.7.2\*

Where total evacuation of occupants is impractical due to building configuration, only the occupants in the affected zones shall be initially notified, and provisions shall be made to selectively notify occupants in other zones to afford orderly evacuation of the entire building, provided that such arrangement is approved by the AHJ. [101:9.6.3.7.2]

13.7.1.9.7.3

Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, all of the following shall apply:

The private operating mode as described in NFPA 72 shall be permitted to be used.

Only the attendants and other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified.

Notification of personnel as specified in 13.7.1.9.7.3(2) shall include means to readily identify the zone, area, floor, or building in need of evacuation.

[101:9.6.3.7.3]

13.7.1.9.7.4

The general evacuation signal shall not be required in exit stair enclosures. [101:9.6.3.7.4]

13.7.1.9.7.5

The general evacuation signal shall not be required in elevator cars. [101:9.6.3.7.5]

13.7.1.9.8

Audible alarm notification appliances shall be of such character and so distributed as to be effectively heard above the average ambient sound level that exists under normal conditions of occupancy. [101:9.6.3.8]

13.7.1.9.9

Audible alarm notification appliances shall produce signals that are distinctive from audible signals used for other purposes in a given building. [101:9.6.3.9]

13.7.1.9.10

Automatically transmitted or live voice evacuation or relocation instructions shall be permitted to be used to notify occupants and shall comply with either 13.7.1.9.10.1 or 13.7.1.9.10.2. [101:9.6.3.10]

13.7.1.9.10.1

Automatically transmitted or live voice evacuation or relocation instructions shall be in accordance with NFPA 72. [101:9.6.3.10.1]

13.7.1.9.10.2

Where permitted by Chapters 11 through 43 of NFPA 101, automatically transmitted or live voice announcements shall be permitted to be made via a voice communication or public address system that complies with all of the following:

Occupant notification, either live or recorded, shall be initiated at a constantly attended receiving station by personnel trained to respond to an emergency.

An approved secondary power supply shall be provided for other than existing, previously approved systems.

The system shall be audible above the expected ambient noise level.

Emergency announcements shall take precedence over any other use.

[101:9.6.3.10.2]

13.7.1.9.11

Unless otherwise permitted by another section of this Code, audible and visible fire alarm notification appliances shall comply with either 13.7.1.9.11.1 or 13.7.1.9.11.2. [101:9.6.3.11]

13.7.1.9.11.1

Audible and visible fire alarm notification appliances shall be used only for fire alarm system or other emergency purposes. [101:9.6.3.11.1]

13.7.1.9.11.2

Emergency voice/alarm communication systems shall be permitted to be used for other purposes in accordance with NFPA 72. [101:9.6.3.11.2]

13.7.1.10 Emergency Forces Notification

13.7.1.10.1

Where required by another section of this Code, emergency forces notification shall be provided to alert the municipal fire department and fire brigade (if provided) of fire or other emergency. [101:9.6.4.1]

13.7.1.10.2

Where emergency forces notification is required by another section of this Code, the fire alarm system shall be arranged to transmit the alarm automatically via any of the following means acceptable to the AHJ and shall be in accordance with NFPA 72:

Auxiliary fire alarm system

Central station fire alarm system

Proprietary supervising station fire alarm system

Remote supervising station fire alarm system

[101:9.6.4.2]

13.7.1.10.3

For existing installations where none of the means of notification specified in 13.7.1.10.2(1) through 13.7.1.10.2(4) are available, an approved plan for notification of the municipal fire department shall be permitted. [101:9.6.4.3]

13.7.1.10.4

For other than existing installations, where fire alarm systems are required to provide emergency forces notification, supervisory signals and trouble signals shall sound and be visibly displayed either at an approved, remotely located receiving facility or at a location within the protected building that is constantly attended by qualified personnel. [101:9.6.4.4]

13.7.1.10.5\*

The use of a system that transmits signals directly to an emergency forces call center shall comply with NFPA 72.

13.7.1.11 Emergency Control Functions

13.7.1.11.1

Emergency control functions shall be installed in accordance with the requirements of NFPA 72. [101:9.6.6.1]

13.7.1.11.2

Where required by another section of this Code, the following functions shall be actuated:

Release of hold-open devices for doors or other opening protectives

Stairwell or elevator shaft pressurization

Smoke management or smoke control systems

Unlocking of doors

Elevator recall and shutdown

HVAC shutdown

[101:9.6.6.2]

13.7.1.12 Location of Controls

Operator controls, alarm indicators, and manual communications capability shall be installed at a convenient location acceptable to the AHJ. [101:9.6.7]

13.7.1.13 Annunciation

13.7.1.13.1

Where alarm annunciation is required by another section of this Code, it shall comply with 13.7.1.13.2 through 13.7.1.13.13. [101:9.6.8.1]

13.7.1.13.2 Alarm Annunciation

Where required by other governing laws, codes, or standards, the location of an operated initiating device shall be annunciated by visible means. [72:10.18.1.1]

13.7.1.13.2.1

Visible annunciation of the location of an operated initiating device shall be by an indicator lamp, alphanumeric display, printout, or other approved means. [72:10.18.1.1.1]

13.7.1.13.2.2

The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances. [72:10.18.1.1.2]

13.7.1.13.3 Supervisory and Trouble Annunciation

Where required by other governing laws, codes, or standards, supervisory and/or trouble conditions shall be annunciated by visible means. [72:10.18.2.1]

13.7.1.13.3.1

Visible annunciation shall be by an indicator lamp, an alphanumeric display, a printout, or other means. [72:10.18.2.1.1]

13.7.1.13.3.2

The visible annunciation of supervisory and/or trouble conditions shall not be canceled by the means used to deactivate supervisory or trouble notification appliances. [72:10.18.2.1.2]

13.7.1.13.4\* Annunciator Access and Location

13.7.1.13.4.1

All required annunciation means shall be readily accessible to responding personnel. [72:10.18.3.1]

13.7.1.13.4.2

All required annunciation means shall be located as required by the AHJ to facilitate an efficient response to the situation. [72:10.18.3.2]

13.7.1.13.5 Alarm Annunciation Display

Visible annunciators shall be capable of displaying all zones in alarm. [72:10.18.4]

13.7.1.13.5.1

If all zones in alarm are not displayed simultaneously, the zone of origin shall be displayed. [72:10.18.4.1]

13.7.1.13.5.2

If all zones in alarm are not displayed simultaneously, there shall be an indication that other zones are in alarm. [72:10.18.4.2]

13.7.1.13.6\* Annunciation Zoning

13.7.1.13.6.1

For the purpose of alarm annunciation, each floor of the building shall be considered as a separate zone. [72:10.18.5.1]

13.7.1.13.6.2

For the purposes of alarm annunciation, if a floor of the building is subdivided into multiple zones by fire or smoke barriers and the fire plan for the protected premises allows relocation of occupants from the zone of origin to another zone on the same floor, each zone on the floor shall be annunciated separately. [72:10.18.5.2]

13.7.1.13.6.3

Where the system serves more than one building, each building shall be annunciated separately. [72:10.18.5.3]

13.7.1.13.7

Alarm annunciation at the control center shall be by means of audible and visible indicators. [101:9.6.8.2]

13.7.1.13.8

For the purposes of alarm annunciation, each floor of the building, other than floors of existing buildings, shall be considered as not less than one zone, unless otherwise permitted by 13.7.1.13.9.4, 13.7.1.13.9.5, 13.7.1.13.9.6, or as another section of this Code. [101:9.6.8.3]

13.7.1.13.9

Where a floor area exceeds 22,500 ft2 (2090 m2), additional fire alarm zoning shall be provided, and the length of any single fire alarm zone shall not exceed 300 ft (91 m) in any direction, except as provided in 13.7.1.13.9.1 through 13.7.1.13.9.6 or otherwise modified by another section of this Code. [101:9.6.8.4]

13.7.1.13.9.1

Where permitted by another section of this Code, fire alarm zones shall be permitted to exceed 22,500 ft2 (2090 m2), and the length of a zone shall be permitted to exceed 300 ft (91 m) in any direction. [101:9.6.8.4.1]

13.7.1.13.9.2

Where the building is protected by an automatic sprinkler system in accordance with NFPA 13, the area of the fire alarm zone shall be permitted to coincide with the allowable area of the sprinkler system. [101:9.6.8.4.2]

13.7.1.13.9.3

Where the building is protected by a water mist system in accordance with 9.8.1 and Table 9.8.1 of NFPA 101, the area of the fire alarm zone shall be permitted to coincide with the allowable area of the water mist system. [101:9.6.8.4.3]

13.7.1.13.9.4

Unless otherwise prohibited by another section of this Code, where a building not exceeding four stories in height is protected by an automatic water mist system in accordance with 9.8.1 of NFPA 101, the water mist system shall be permitted to be annunciated on the fire alarm system as a single zone. [101:9.6.8.4.4]

13.7.1.13.9.5

Unless otherwise prohibited by another section of this Code, where a building not exceeding four stories in height is protected by an automatic sprinkler system in accordance with NFPA 13, the sprinkler system shall be permitted to be annunciated on the fire alarm system as a single zone. [101:9.6.8.4.5]

13.7.1.13.9.6

Where the building is protected by an automatic sprinkler system in accordance with NFPA 13D or NFPA 13R, the sprinkler system shall be permitted to be annunciated on the fire alarm system as a single zone. [101:9.6.8.4.6]

13.7.1.13.10

A system trouble signal shall be annunciated by means of audible and visible indicators, in accordance with NFPA 72. [101:9.6.8.5]

13.7.1.13.11

A system supervisory signal shall be annunciated by means of audible and visible indicators in accordance with NFPA 72. [101:9.6.8.6]

13.7.1.13.12

Where the system serves more than one building, each building shall be annunciated separately. [101:9.6.8.7]

13.7.1.13.13

Where permitted by another section of this Code, the alarm zone shall be permitted to coincide with the permitted area for smoke compartments. [101:9.6.8.8]

13.7.1.14 Carbon Monoxide (CO) Detection and Warning Equipment

Where required by another section of this Code, carbon monoxide (CO) detection and warning equipment shall be provided in accordance with NFPA 72. [101:9.12]

13.7.1.15\* Risk Analysis for Mass Notification Systems

Diagram

Upcodes Diagrams

13.7.1.15.1\*

Where required by another section of this Code, a risk analysis for mass notification systems shall be provided in accordance with the requirements of Chapter 24 of NFPA 72. [101:9.14.1]

13.7.1.15.2

Where a mass notification system is required by the risk analysis in 13.7.1.15.1, the system shall be in accordance with the requirements of Chapter 24 of NFPA 72. [101:9.14.2]

13.7.2 Where Required and Occupancy Requirements

13.7.2.1 New Assembly Occupancies

13.7.2.1.1 General

Diagram

UpCodes Diagrams

P

Fire Alarms: Assy. Occ. (NFPA)

13.7.2.1.1.1

New assembly occupancies with occupant loads of more than 300 and all theaters with more than one audience-viewing room shall be provided with an approved fire alarm system in accordance with Section 13.7 and 13.7.2.1, unless otherwise permitted by 13.7.2.1.1.2. [101:12.3.4.1.1]

13.7.2.1.1.2

New assembly occupancies that are a part of a multiple occupancy protected as a mixed occupancy (see 6.1.14) shall be permitted to be served by a common fire alarm system, provided that the individual requirements of each occupancy are met. [101:12.3.4.1.2]

13.7.2.1.2 Initiation

13.7.2.1.2.1

Initiation of the required fire alarm system shall be by both of the following means:

Manual means in accordance with 13.7.1.7.1(1), unless otherwise permitted by one of the following:

The requirement of 13.7.2.1.2.1(1) shall not apply where initiation is by means of an approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides fire detection throughout the building.

The requirement of 13.7.2.1.2.1(1) shall not apply where initiation is by means of an approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides fire detection and protection throughout the building.

Where automatic sprinklers are provided, initiation of the fire alarm system by sprinkler system waterflow, even where manual fire alarm boxes are provided in accordance with 13.7.2.1.2.1(1)

[101:12.3.4.2.1]

13.7.2.1.2.2

The initiating device shall be capable of transmitting an alarm to a receiving station, located within the building, that is constantly attended when the assembly occupancy is occupied. [101:12.3.4.2.2]

13.7.2.1.2.3\*

In new assembly occupancies with occupant loads of more than 300, automatic detection shall be provided in all hazardous areas that are not normally occupied, unless such areas are protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3. [101:12.3.4.2.3]

13.7.2.1.3 Notification

The required fire alarm system shall activate an audible and visible alarm in a constantly attended receiving station within the building when occupied for purposes of initiating emergency action. [101:12.3.4.3]

13.7.2.1.3.1

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:12.3.4.3.1]

13.7.2.1.3.2 Reserved

13.7.2.1.3.3

Occupant notification shall be by means of voice announcements in accordance with 13.7.1.9.10, initiated by the person in the constantly attended receiving station. [101:12.3.4.3.3]

13.7.2.1.3.4

Occupant notification shall be by means of visible signals in accordance with 13.7.1.9.6, initiated by the person in the constantly attended receiving station, unless otherwise permitted by 13.7.2.1.3.5. [101:12.3.4.3.4]

13.7.2.1.3.5\*

Visible signals shall not be required in the assembly seating area, or the floor area used for the contest, performance, or entertainment, where the occupant load exceeds 1000 and an approved, alternative visible means of occupant notification is provided. (See 13.7.1.9.6.7.) [101:12.3.4.3.5]

13.7.2.1.3.6

The announcement shall be permitted to be made via a voice communication or public address system in accordance with 13.7.1.9.10.2. [101:12.3.4.3.6]

13.7.2.1.3.7

Where the AHJ determines that a constantly attended receiving station is impractical, both of the following shall be provided:

Automatically transmitted evacuation or relocation instructions shall be provided in accordance with NFPA 72.

The system shall be monitored by a supervising station in accordance with NFPA 72.

[101:12.3.4.3.7]

13.7.2.1.4 Carbon Monoxide Detection

13.7.2.1.4.1

New assembly occupancies shall be provided with carbon monoxide detection and warning equipment in accordance with 13.7.1.14 in the locations specified as follows:

On the ceilings of rooms containing permanently installed fuel-burning appliances or fuel-burning fireplaces

Centrally located within occupiable spaces served by the first supply air register from permanently installed fuel-burning HVAC systems

\* Centrally located within occupiable spaces adjacent to an attached garage

[101:12.3.4.4.1]

13.7.2.1.4.2

Carbon monoxide detectors as specified in 13.7.2.1.4.1 shall not be required in the following locations:

Garages

Occupiable spaces with attached garages that are open parking structures as defined in 3.3.199.26.3.

Occupiable spaces with attached garages that are mechanically ventilated in accordance with the mechanical code

[101:12.3.4.4.2]

13.7.2.1.5 Risk Analysis for Mass Notification Systems

A risk analysis in accordance with 13.7.1.15 shall be performed for new assembly occupancies with an occupant load of 500 or more to determine if a mass notification system is required. [101:12.3.4.5]

13.7.2.2 Existing Assembly Occupancies

13.7.2.2.1 General

13.7.2.2.1.1

Existing assembly occupancies with occupant loads of more than 300 and all theaters with more than one audience-viewing room shall be provided with an approved fire alarm system in accordance with Section 13.7 and 13.7.2.2, unless otherwise permitted by 13.7.2.2.1.2, 13.7.2.2.1.3, or 13.7.2.2.1.4. [101:13.3.4.1.1]

13.7.2.2.1.2

Existing assembly occupancies that are a part of a multiple occupancy protected as a mixed occupancy (see 6.1.14) shall be permitted to be served by a common fire alarm system, provided that the individual requirements of each occupancy are met. [101:13.3.4.1.2]

13.7.2.2.1.3

Voice communication or public address systems complying with 13.7.2.2.3.6 shall not be required to comply with Section 13.7. [101:13.3.4.1.3]

13.7.2.2.1.4

The requirement of 13.7.2.2.1.1 shall not apply to existing assembly occupancies where, in the judgment of the AHJ, adequate alternative provisions exist or are provided for the discovery of a fire and for alerting the occupants promptly. [101:13.3.4.1.4]

13.7.2.2.2 Initiation

13.7.2.2.2.1

Initiation of the required fire alarm system shall be by both of the following means, and the system shall be provided with an emergency power source:

Manual means in accordance with 13.7.1.7.1(1), unless otherwise permitted by one of the following:

The requirement of 13.7.2.2.2.1(1) shall not apply where initiation is by means of an approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides fire detection throughout the building.

The requirement of 13.7.2.2.2.1(1) shall not apply where initiation is by means of an approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides fire detection and protection throughout the building.

Where automatic sprinklers are provided, initiation of the fire alarm system by sprinkler system waterflow, even where manual fire alarm boxes are provided in accordance with 13.7.2.2.2.1(1)

[101:13.3.4.2.1]

13.7.2.2.2.2

The initiating device shall be capable of transmitting an alarm to a receiving station, located within the building, that is constantly attended when the assembly occupancy is occupied. [101:13.3.4.2.2]

13.7.2.2.2.3\*

In existing assembly occupancies with occupant loads of more than 300, automatic detection shall be provided in all hazardous areas that are not normally occupied, unless such areas are protected throughout by an approved automatic sprinkler system in accordance with Section 13.3. [101:13.3.4.2.3]

13.7.2.2.3 Notification

The required fire alarm system shall activate an audible alarm in a constantly attended receiving station within the building when occupied for purposes of initiating emergency action. [101:13.3.4.3]

13.7.2.2.3.1

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:13.3.4.3.1]

13.7.2.2.3.2

A presignal system in accordance with 13.7.1.9.4 shall be permitted. [101:13.3.4.3.2]

13.7.2.2.3.3

Occupant notification shall be by means of voice announcements in accordance with 13.7.1.9.10 initiated by the person in the constantly attended receiving station. [101:13.3.4.3.3]

13.7.2.2.3.4 Reserved

13.7.2.2.3.5 Reserved

13.7.2.2.3.6

The announcement shall be permitted to be made via a voice communication or public address system in accordance with 13.7.1.9.10.2. [101:13.3.4.3.6]

13.7.2.2.3.7

Where the AHJ determines that a constantly attended receiving station is impractical, automatically transmitted evacuation or relocation instructions shall be provided in accordance with NFPA 72. [101:13.3.4.3.7]

13.7.2.3 New Educational Occupancies

13.7.2.3.1 General

13.7.2.3.1.1

New educational occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.3. [101:14.3.4.1.1]

13.7.2.3.1.2

The requirement of 13.7.2.3.1.1 shall not apply to buildings meeting all of the following criteria:

Buildings having an area not exceeding 1000 ft2 (93 m2)

Buildings containing a single classroom

Buildings located not less than 30 ft (9.1 m) from another building

[101:14.3.4.1.2]

13.7.2.3.2 Initiation

13.7.2.3.2.1 General

Initiation of the required fire alarm system, other than as permitted by 13.7.2.3.2.3, shall be by manual means in accordance with 13.7.1.7.1(1). [101:14.3.4.2.1]

13.7.2.3.2.2 Automatic Initiation

In buildings provided with automatic sprinkler protection, the operation of the sprinkler system shall automatically activate the fire alarm system in addition to the initiation means required in 13.7.2.3.2.1. [101:14.3.4.2.2]

13.7.2.3.2.3 Alternative Protection System

Manual fire alarm boxes shall be permitted to be eliminated in accordance with 13.7.2.3.2.3.1 or 13.7.2.3.2.3.2. [101:14.3.4.2.3]

13.7.2.3.2.3.1\*

Manual fire alarm boxes shall be permitted to be eliminated where all of the following conditions apply:

Interior corridors are protected by smoke detectors in accordance with Section 13.7.

Auditoriums, cafeterias, and gymnasiums are protected by heat-detection devices or other approved detection devices.

Shops and laboratories involving dusts or vapors are protected by heat-detection devices or other approved detection devices.

Provision is made at a central point to manually activate the evacuation signal or to evacuate only affected areas.

[101:14.3.4.2.3.1]

13.7.2.3.2.3.2\*

Manual fire alarm boxes shall be permitted to be eliminated where both of the following conditions apply:

The building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3.

Provision is made at a central point to manually activate the evacuation signal or to evacuate only affected areas.

[101:14.3.4.2.3.2]

13.7.2.3.3 Notification

13.7.2.3.3.1 Occupant Notification

13.7.2.3.3.1.1

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9. [101:14.3.4.3.1.1]

13.7.2.3.3.1.2

The occupant notification required by 13.7.2.3.3.1.1 shall utilize an emergency voice/alarm communication system in accordance with 13.7.1.9 where the building has an occupant load of more than 100. [101:14.3.4.3.1.2]

13.7.2.3.3.1.3

Positive alarm sequence shall be permitted in accordance with 13.7.1.9.5. [101:14.3.4.3.1.3]

13.7.2.3.3.1.4

In accordance with 13.7.1.9.11.2, the emergency voice/alarm communication system shall be permitted to be used for other emergency signaling or for class changes. [101:14.3.4.3.1.4]

13.7.2.3.3.1.5

To prevent students from being returned to a building that is burning, the recall signal shall be separate and distinct from any other signals, and such signal shall be permitted to be given by use of distinctively colored flags or banners. [101:14.3.4.3.1.5]

13.7.2.3.3.1.6

If the recall signal required by 13.7.2.3.3.1.5 is electric, the push buttons or other controls shall be kept under lock, the key for which shall be in the possession of the principal or another designated person in order to prevent a recall at a time when there is an actual fire. [101:14.3.4.3.1.6]

13.7.2.3.3.1.7

Regardless of the method of recall signal, the means of giving the recall signal shall be kept under lock. [101:14.3.4.3.1.7]

13.7.2.3.3.2 Emergency Forces Notification

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:14.3.4.3.2]

13.7.2.3.4 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.3.4.1

Carbon monoxide detectors in accordance with 13.7.1.14 shall be provided in new educational occupancies in the locations specified as follows:

Carbon monoxide detectors shall be installed on the ceilings of rooms containing permanently installed fuel-burning appliances.

Carbon monoxide detectors shall be installed centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuel-burning HVAC system.

Carbon monoxide detectors shall be installed centrally located within occupiable spaces adjacent to a communicating attached garage.

Carbon monoxide detectors shall be installed centrally located within occupiable spaces adjacent to an attached garage with a separation wall constructed of gypsum wallboard.

[101:14.3.4.4.1]

13.7.2.3.4.2

Carbon monoxide detectors as specified in 13.7.2.3.4.1 shall not be required in the following locations:

Garages

Occupiable spaces with communicating attached garages that are open parking structures as defined in 3.3.199.26.3

Occupiable spaces with communicating attached garages that are mechanically ventilated in accordance with the applicable mechanical code

Occupiable spaces that are separated from attached garages by walls constructed of gypsum wallboard where the garage is an open parking structure as defined in 3.3.199.26.3

Occupiable spaces that are separated from attached garages by walls constructed of gypsum wallboard where the garage is mechanically ventilated in accordance with the mechanical code

[101:14.3.4.4.3]

13.7.2.3.5 Risk Analysis for Mass Notification Systems

A risk analysis in accordance with 13.7.1.15 shall be performed to determine if a mass notification system is required. [101:14.3.4.5]

13.7.2.4 Existing Educational Occupancies

13.7.2.4.1 General

13.7.2.4.1.1

Existing educational occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.4. [101:15.3.4.1.1]

13.7.2.4.1.2

The requirement of 13.7.2.4.1.1 shall not apply to buildings meeting all of the following criteria:

Buildings having an area not exceeding 1000 ft2 (93 m2)

Buildings containing a single classroom

Buildings located not less than 30 ft (9.1 m) from another building

[101:15.3.4.1.2]

13.7.2.4.2 Initiation

13.7.2.4.2.1 General

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7(1), unless otherwise permitted by one of the following:

Manual fire alarm boxes shall not be required where permitted by 13.7.2.4.2.3.

In buildings where all normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, the manual fire alarm boxes shall not be required, except in locations specifically designated by the AHJ.

[101:15.3.4.2.1]

13.7.2.4.2.2 Automatic Initiation

In buildings provided with automatic sprinkler protection, the operation of the sprinkler system shall automatically activate the fire alarm system in addition to the initiation means required in 13.7.2.4.2.1. [101:15.3.4.2.2]

13.7.2.4.2.3 Alternative Protection System

Manual fire alarm boxes shall be permitted to be eliminated in accordance with 13.7.2.4.2.3.1 or 13.7.2.4.2.3.2. [101:15.3.4.2.3]

13.7.2.4.2.3.1\*

Manual fire alarm boxes shall be permitted to be eliminated where all of the following conditions apply:

Interior corridors are protected by smoke detectors using an alarm verification system as described in NFPA 72.

Auditoriums, cafeterias, and gymnasiums are protected by heat-detection devices or other approved detection devices.

Shops and laboratories involving dusts or vapors are protected by heat-detection devices or other approved detection devices.

Provision is made at a central point to manually activate the evacuation signal or to evacuate only affected areas.

[101:15.3.4.2.3.1]

13.7.2.4.2.3.2\*

Manual fire alarm boxes shall be permitted to be eliminated where both of the following conditions apply:

The building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 13.3.

Provision is made at a central point to manually activate the evacuation signal or to evacuate only affected areas.

[101:15.3.4.2.3.2]

13.7.2.4.3 Notification

13.7.2.4.3.1 Occupant Notification

13.7.2.4.3.1.1\*

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9. [101:14.3.4.3.1.1]

13.7.2.4.3.1.2 Reserved

13.7.2.4.3.1.3

Positive alarm sequence shall be permitted in accordance with 13.7.1.9.5. [101:15.3.4.3.1.3]

13.7.2.4.3.1.4

Where acceptable to the AHJ, the fire alarm system shall be permitted to be used for other emergency signaling or for class changes, provided that the fire alarm is distinctive in signal and overrides all other use. [101:15.3.4.3.1.4]

13.7.2.4.3.1.5

To prevent students from being returned to a building that is burning, the recall signal shall be separate and distinct from any other signals, and such signal shall be permitted to be given by use of distinctively colored flags or banners. [101:15.3.4.3.1.5]

13.7.2.4.3.1.6

If the recall signal required by 13.7.2.4.3.1.5 is electric, the push buttons or other controls shall be kept under lock, the key for which shall be in the possession of the principal or another designated person in order to prevent a recall at a time when there is an actual fire. [101:15.3.4.3.1.6]

13.7.2.4.3.1.7

Regardless of the method of recall signal, the means of giving the recall signal shall be kept under lock. [101:15.3.4.3.1.7]

13.7.2.4.3.2 Emergency Forces Notification

13.7.2.4.3.2.1

Wherever any of the school authorities determine that an actual fire exists, they shall immediately call the local fire department using the public fire alarm system or other available facilities. [101:15.3.4.3.2.1]

13.7.2.4.3.2.2

Emergency forces notification shall be accomplished in accordance with 13.7.1.10 where the existing fire alarm system is replaced. [101:15.3.4.3.2.2]

13.7.2.5 New Day-Care Occupancies

13.7.2.5.1 General

New day-care occupancies, other than day-care occupancies housed in one room having at least one door opening directly to the outside at grade plane or to an exterior exit access balcony in accordance with 14.10.3, shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.5. [101:16.3.4.1]

13.7.2.5.2 Initiation

Initiation of the required fire alarm system shall be by manual means and by operation of any required smoke detectors and required sprinkler systems. (See 13.7.2.5.5.) [101:16.3.4.2]

13.7.2.5.3 Occupant Notification

13.7.2.5.3.1

Occupant notification shall be in accordance with 13.7.1.9. [101:16.3.4.3.1]

13.7.2.5.3.2

Positive alarm sequence shall be permitted in accordance with 13.7.1.9.5. [101:16.3.4.3.2]

13.7.2.5.3.3

Private operating mode in accordance with 13.7.1.9.7.3 shall be permitted. [101:16.3.4.3.3]

13.7.2.5.4 Emergency Forces Notification

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:16.3.4.4]

13.7.2.5.5 Detection

A smoke detection system in accordance with 13.7.1 shall be installed in new day-care occupancies, other than those housed in one room having at least one door opening directly to the outside at grade plane or to an exterior exit access balcony in accordance with 14.10.3, and such system shall comply with both of the following:

Detectors shall be installed on each story in front of the doors to the stairways and in the corridors of all floors occupied by the day-care occupancy.

Detectors shall be installed in lounges, recreation areas, and sleeping rooms in the day-care occupancy.

[101:16.3.4.5]

13.7.2.5.6 New Day-Care Homes

13.7.2.5.6.1

Smoke alarms shall be installed within day-care homes in accordance with 13.7.1.8. [101:16.6.3.4.1]

13.7.2.5.6.2

Where a day-care home is located within a building of another occupancy, such as in an apartment building or office building, any corridors serving the day-care home shall be provided with a smoke detection system in accordance with 13.7.1.4 except as otherwise provided in 13.7.2.5.6.3. [101:16.6.3.4.2]

13.7.2.5.6.3

The corridor smoke detection system addressed in 13.7.2.5.6.2 shall not be required where all of the following conditions are met:

The day-care home is in a building of another occupancy that is not required to have a fire alarm system by some other provision of this Code.

Smoke alarms are installed in accordance with 13.7.1.8 in the corridor serving the day-care home.

Smoke alarms are installed within the day-care home as required by 13.7.2.5.6.1.

Additional smoke alarms are installed within the day-care home within 15 ft (4.6 m) of all sleeping rooms.

The smoke alarms required by 13.7.2.5.6.3(2), 13.7.2.5.6.3(3), and 13.7.2.5.6.3(4) are interconnected, as required by NFPA 72, so that each sounds an alarm when any of these smoke alarms detects smoke.

[101:16.6.3.4.3]

13.7.2.5.6.4

Single-station or multiple-station smoke alarms or smoke detectors shall be provided in all rooms used for sleeping in accordance with 13.7.1.8. [101:16.6.3.4.4]

13.7.2.5.6.5

Single-station or multiple-station carbon monoxide alarms or detectors shall be provided in accordance with 13.7.1.14 in day-care homes where client sleeping occurs and one or both of the following conditions exist:

Fuel-fired equipment is present.

An enclosed parking structure is attached to the day-care home.

[101:16.6.3.4.6]

13.7.2.6 Existing Day-Care Occupancies

13.7.2.6.1 General

Existing day-care occupancies, other than day-care occupancies housed in one room, shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.6. [101:17.3.4.1]

13.7.2.6.2 Initiation

Initiation of the required fire alarm system shall be by manual means and by operation of any required smoke detectors and required sprinkler systems. (See 13.7.2.6.5.) [101:17.3.4.2]

13.7.2.6.3 Occupant Notification

13.7.2.6.3.1

Occupant notification shall be in accordance with 13.7.1.9. [101:17.3.4.3.1]

13.7.2.6.3.2

Positive alarm sequence shall be permitted in accordance with 13.7.1.9.5. [101:17.3.4.3.2]

13.7.2.6.3.3

Private operating mode in accordance with 13.7.1.9.7.3 shall be permitted. [101:17.3.4.3.3]

13.7.2.6.4 Emergency Forces Notification

13.7.2.6.4.1

Emergency forces notification, other than for daycare occupancies with not more than 100 clients, shall be accomplished in accordance with 13.7.1.10. [101:17.3.4.4.1]

13.7.2.6.4.2

Emergency forces notification shall be accomplished in accordance with 13.7.1.10 where the existing fire alarm system is replaced. [101:17.3.4.4.2]

13.7.2.6.5 Detection

A smoke detection system in accordance with 13.7.1 shall be installed in existing day-care occupancies, other than those housed in one room or those housing clients capable of self-preservation where no sleeping facilities are provided, and such system shall comply with both of the following:

Detectors shall be installed on each story in front of the doors to the stairways and in the corridors of all floors occupied by the day-care occupancy.

Detectors shall be installed in lounges, recreation areas, and sleeping rooms in the day-care occupancy.

[101:17.3.4.5]

13.7.2.6.6 Existing Day-Care Homes

13.7.2.6.6.1

Smoke alarms shall be installed within day-care homes in accordance with 13.7.1.8. [101:17.6.3.4.1]

13.7.2.6.6.2

Where a day-care home is located within a building of another occupancy, such as in an apartment building or office building, any corridors serving the day-care home shall be provided with a smoke detection system in accordance with 13.7.1.7 except as otherwise provided in 13.7.2.6.6.3. [101:17.6.3.4.2]

13.7.2.6.6.3

The corridor smoke detection system addressed in 13.7.2.6.6.2 shall not be required where all of the following conditions are met:

The day-care home is in a building of another occupancy that is not required to have a fire alarm system by another provision of this Code.

Smoke alarms are installed in accordance with 13.7.1.8 in the corridor serving the day-care home.

Smoke alarms are installed within the day-care home as required by 13.7.2.6.6.1.

Additional smoke alarms are installed within the day-care home within 15 ft (4.6 m) of all sleeping rooms.

The smoke alarms required by 13.7.2.6.6.3(2), 13.7.2.6.6.3(3), and 13.7.2.6.6.3(4) are interconnected, as required by NFPA 72, so that each sounds an alarm when any of these smoke alarms detects smoke.

The exemption of 13.7.2.6.6.5 for existing battery-powered smoke alarms does not apply.

[101:17.6.3.4.3]

13.7.2.6.6.4

Single-station or multiple-station smoke alarms or smoke detectors shall be provided in all rooms used for sleeping in accordance with 13.7.1.8, other than as permitted by 13.7.2.6.6.5. [101:17.6.3.4.4]

13.7.2.6.6.5

Approved existing battery-powered smoke alarms, rather than house electrical service-powered smoke alarms required by 13.7.2.6.6.4, shall be permitted where the facility has testing, maintenance, and battery replacement programs that ensure reliability of power to the smoke alarms. [101:17.6.3.4.5]

13.7.2.7 New Health Care Occupancies

13.7.2.7.1 General

New health care occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.7. [101:18.3.4.1]

13.7.2.7.2\* Initiation

13.7.2.7.2.1

Initiation of the required fire alarm systems shall be by manual means in accordance with 13.7.1.7 and by means of any required sprinkler system waterflow alarms, detection devices, or detection systems, unless otherwise permitted by 13.7.2.7.2.2 and 13.7.2.7.2.3. [101:18.3.4.2.1]

13.7.2.7.2.2

Manual fire alarm boxes in patient sleeping areas shall not be required at exits if located at all nurses' control stations or other continuously attended staff location, provided that both of the following criteria are met:

Such manual fire alarm boxes are visible and continuously accessible.

Travel distances required by 13.7.1.7.5 are not exceeded.

[101:18.3.4.2.2]

13.7.2.7.2.3

The system smoke detector installed in accordance with 18.3.2.5.3(13) of NFPA 101 shall not be required to initiate the fire alarm system. [101:18.3.4.2.3]

13.7.2.7.3 Notification

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:18.3.4.3]

13.7.2.7.3.1 Occupant Notification

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9, unless otherwise modified by the following:

Paragraph 13.7.1.9.2.3 shall not be permitted to be used.

\* Where the private operating mode in accordance with NFPA 72 is used, alarm notification appliances shall not be required in patient care spaces where alarm notification adversely affects patient care.

The provision of 18.3.2.5.3(13) (c) of NFPA 101 shall be permitted to be used.

[101:18.3.4.3.1]

13.7.2.7.3.2 Emergency Forces Notification

13.7.2.7.3.2.1

Emergency forces notification shall be accomplished in accordance with 13.7.1.10, except that the provision of 18.3.2.5.3(13) (d) of NFPA 101 shall be permitted to be used. [101:18.3.4.3.2.1]

13.7.2.7.3.2.2 Reserved

13.7.2.7.3.3 Annunciation and Annunciation Zoning

13.7.2.7.3.3.1

Annunciation and annunciation zoning shall be provided in accordance with 13.7.1.13, unless otherwise permitted by 13.7.2.7.3.3.2 or 13.7.2.7.3.3.3. [101:18.3.4.3.3.1]

13.7.2.7.3.3.2

The alarm zone shall be permitted to coincide with the permitted area for smoke compartments. [101:18.3.4.3.3.2]

13.7.2.7.3.3.3

The provision of 13.7.1.13.9.2, which permits sprinkler system waterflow to be annunciated as a single building zone, shall be prohibited. [101:18.3.4.3.3.3]

13.7.2.7.4 Emergency Control Functions

Operation of any activating device in the required fire alarm system shall be arranged to accomplish automatically any control functions to be performed by that device. (See 13.7.1.11.) [101:18.3.4.4]

13.7.2.7.5 Detection

13.7.2.7.5.1 General

Detection systems, where required, shall be in accordance with Section 13.7. [101:18.3.4.5.1]

13.7.2.7.5.2 Detection in Spaces Open to Corridors

See 18.3.6.1 of NFPA 101. [101:18.3.4.5.2]

13.7.2.7.5.3\* Nursing Homes

An approved automatic smoke detection system shall be installed in corridors throughout smoke compartments containing patient sleeping rooms and in spaces open to corridors as permitted in nursing homes by 18.3.6.1 of NFPA 101, unless otherwise permitted by one of the following:

Corridor systems shall not be required where each patient sleeping room is protected by an approved smoke detection system.

Corridor systems shall not be required where patient room doors are equipped with automatic door-closing devices with integral smoke detectors on the room side installed in accordance with their listing, provided that the integral detectors provide occupant notification.

[101:18.3.4.5.3]

13.7.2.8 Existing Health Care Occupancies

13.7.2.8.1 General

Existing health care occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.8. [101:19.3.4.1]

13.7.2.8.2\* Initiation

13.7.2.8.2.1

Initiation of the required fire alarm systems shall be by manual means in accordance with 13.7.1.7 and by means of any required sprinkler system waterflow alarms, detection devices, or detection systems, unless otherwise permitted by 13.7.2.8.2.2 through 13.7.2.8.2.5. [101:19.3.4.2.1]

13.7.2.8.2.2

Manual fire alarm boxes in patient sleeping areas shall not be required at exits if located at all nurses' control stations or other continuously attended staff location, provided that both of the following criteria are met:

Such manual fire alarm boxes are visible and continuously accessible.

Travel distances required by 13.7.1.7.5 are not exceeded.

[101:19.3.4.2.2]

13.7.2.8.2.3

The system smoke detector installed in accordance with 19.3.2.5.3(13) of NFPA 101 shall not be required to initiate the fire alarm system. [101:19.3.4.2.3]

13.7.2.8.2.4

Fixed extinguishing systems protecting commercial cooking equipment in kitchens that are protected by a complete automatic sprinkler system shall not be required to initiate the fire alarm system. [101:19.3.4.2.4]

13.7.2.8.2.5

Detectors required by 19.7.5.3 and 19.7.5.5 of NFPA 101 shall not be required to initiate the fire alarm system. [101:19.3.4.2.5]

13.7.2.8.3 Notification

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted in health care occupancies protected throughout by an approved, supervised automatic sprinkler system in accordance with NFPA 13. [101:19.3.4.3]

13.7.2.8.3.1 Occupant Notification

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9, unless otherwise modified by the following:

\* In lieu of audible alarm signals, visible alarm-indicating appliances shall be permitted to be used in critical care areas.

Where visual devices have been installed in patient sleeping areas in place of an audible alarm, they shall be permitted where approved by the AHJ.

The provision of 19.3.2.5.3(13) (c) of NFPA 101 shall be permitted to be used.

\* Where the private operating mode in accordance with NFPA 72 is used, alarm notification appliances shall not be required in patient care spaces where alarm notification adversely affects patient care.

[101:19.3.4.3.1]

13.7.2.8.3.2 Emergency Forces Notification

13.7.2.8.3.2.1

Emergency forces notification shall be accomplished in accordance with 13.7.1.10, except that the provision of 19.3.2.5.3(13) (d) of NFPA 101 shall be permitted to be used. [101:19.3.4.3.2.1]

13.7.2.8.3.2.2

Smoke detection devices or smoke detection systems equipped with reconfirmation features shall not be required to automatically notify the fire department, unless the alarm condition is reconfirmed after a period not exceeding 120 seconds. [101:19.3.4.3.2.2]

13.7.2.8.3.3 Reserved

13.7.2.8.4 Emergency Control Functions

Operation of any activating device in the required fire alarm system shall be arranged to accomplish automatically any control functions to be performed by that device. (See 13.7.1.11.) [101:19.3.4.4]

13.7.2.8.5 Detection

13.7.2.8.5.1 Corridors

An approved automatic smoke detection system in accordance with Section 13.7 shall be installed in all corridors of limited care facilities, unless otherwise permitted by one of the following:

Where each patient sleeping room is protected by an approved smoke detection system, and a smoke detector is provided at smoke barriers and horizontal exits in accordance with Section 13.7, the corridor smoke detection system shall not be required on the patient sleeping room floors.

Smoke compartments protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.11.9 shall be permitted.

[101:19.3.4.5.1]

13.7.2.8.5.2 Detection in Spaces Open to Corridors

See 19.3.6.1 of NFPA 101. [101:19.3.4.5.2]

13.7.2.9 New Ambulatory Health Care Occupancies

13.7.2.9.1 General

New ambulatory health care facilities shall be provided with fire alarm systems in accordance with Section 13.7 and 13.7.2.9, except as modified by 13.7.2.9.2 through 13.7.2.9.4. [101:20.3.4.1]

13.7.2.9.2 Initiation

Initiation of the required fire alarm systems shall be by manual means in accordance with 13.7.1.7 and by means of any detection devices or detection systems required. [101:20.3.4.2]

13.7.2.9.3 Notification

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:20.3.4.3]

13.7.2.9.3.1 Occupant Notification

13.7.2.9.3.1.1

Occupant notification shall be accomplished automatically, without delay, in accordance with 13.7.1.9 upon operation of any fire alarm activating device. [101:20.3.4.3.1.1]

13.7.2.9.3.1.2\*

Where the private operating mode in accordance with NFPA 72 is used, alarm notification appliances shall not be required in patient care spaces where alarm notification adversely affects patient care. [101:20.3.4.3.1.2]

13.7.2.9.3.2 Emergency Forces Notification

13.7.2.9.3.2.1

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:20.3.4.3.2.1]

13.7.2.9.3.2.2 Reserved

13.7.2.9.4 Emergency Control Functions

Operation of any activating device in the required fire alarm system shall be arranged to accomplish automatically, without delay, any control functions required to be performed by that device. (See 13.7.1.11.) [101:20.3.4.4]

13.7.2.10 Existing Ambulatory Health Care Occupancies

13.7.2.10.1 General

Existing ambulatory health care facilities shall be provided with fire alarm systems in accordance with Section 13.7 and 13.7.2.10, except as modified by 13.7.2.10.2 through 13.7.2.10.4. [101:21.3.4.1]

13.7.2.10.2 Initiation

Initiation of the required fire alarm systems shall be by manual means in accordance with 13.7.1.7 and by means of any detection devices or detection systems required. [101:21.3.4.2]

13.7.2.10.3 Notification

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:21.3.4.3]

13.7.2.10.3.1 Occupant Notification

13.7.2.10.3.1.1

Occupant notification shall be accomplished automatically, without delay, in accordance with 13.7.1.9 upon operation of any fire alarm activating device. [101:21.3.4.3.1.1]

13.7.2.10.3.1.2\*

Where the private operating mode in accordance with NFPA 72 is used, alarm notification appliances shall not be required in patient care spaces where alarm notification adversely affects patient care. [101:21.3.4.3.1.2]

13.7.2.10.3.2 Emergency Forces Notification

13.7.2.10.3.2.1

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:21.3.4.3.2.1]

13.7.2.10.3.2.2

Smoke detection devices or smoke detection systems equipped with reconfirmation features shall not be required to automatically notify the fire department, unless the alarm condition is reconfirmed after a period not exceeding 120 seconds. [101:21.3.4.3.2.2]

13.7.2.10.4 Emergency Control Functions

Operation of any activating device in the required fire alarm system shall be arranged to accomplish automatically, without delay, any control functions required to be performed by that device. (See 13.7.1.11.) [101:21.3.4.4]

13.7.2.11 New Detention and Correctional Occupancies

13.7.2.11.1 General

New detention and correctional occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.11, except as modified by 13.7.2.11.2 through 13.7.2.11.4.3. [101:22.3.4.1]

13.7.2.11.2 Initiation

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7, by means of any required detection devices or detection systems, and by means of waterflow alarm in the sprinkler system required by 13.3.2.12.1, unless otherwise permitted by the following:

Manual fire alarm boxes shall be permitted to be locked, provided that staff is present within the area when it is occupied and staff has keys readily available to unlock the boxes.

Manual fire alarm boxes shall be permitted to be located in a staff location, provided that both of the following criteria are met:

The staff location is attended when the building is occupied.

The staff attendant has direct supervision of the sleeping area.

[101:22.3.4.2]

13.7.2.11.3 Notification

13.7.2.11.3.1 Occupant Notification

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9, and the following also shall apply:

A positive alarm sequence shall be permitted in accordance with 13.7.1.9.5.

\* Any smoke detectors required by this chapter shall be permitted to be arranged to alarm at a constantly attended location only and shall not be required to accomplish general occupant notification.

[101:22.3.4.3.1]

13.7.2.11.3.2 Emergency Forces Notification

13.7.2.11.3.2.1

Fire department notification shall be accomplished in accordance with 13.7.1.10, unless otherwise permitted by one of the following:

A positive alarm sequence shall be permitted in accordance with 13.7.1.9.5.

Any smoke detectors required by this chapter shall not be required to transmit an alarm to the fire department.

This requirement shall not apply where staff is provided at a constantly attended location that meets one of the following criteria:

It has the capability to promptly notify the fire department.

It has direct communication with a control room having direct access to the fire department.

[101:22.3.4.3.2.1]

13.7.2.11.3.2.2

Where the provision of 13.7.2.11.3.2.1(3) is utilized, the fire plan, as required by 20.7.2.1.3, shall include procedures for logging of alarms and immediate notification of the fire department. [101:22.3.4.3.2.2]

13.7.2.11.4\* Detection

An approved automatic smoke detection system shall be in accordance with Section 13.7, as modified by 13.7.2.11.4.1 through 13.7.2.11.4.3, throughout all resident sleeping areas and adjacent day rooms, activity rooms, or contiguous common spaces. [101:22.3.4.4]

13.7.2.11.4.1

Smoke detectors shall not be required in sleeping rooms with four or fewer occupants. [101:22.3.4.4.1]

13.7.2.11.4.2

Other arrangements and positioning of smoke detectors shall be permitted to prevent damage or tampering, or for other purposes. [101:22.3.4.4.2]

13.7.2.11.4.2.1

Other arrangements, as specified in 13.7.2.11.4.2, shall be capable of detecting any fire, and the placement of detectors shall be such that the speed of detection is equivalent to that provided by the spacing and arrangements required by the installation standards referenced in Section 13.7. [101:22.3.4.4.2.1]

13.7.2.11.4.2.2

Detectors shall be permitted to be located in exhaust ducts from cells, behind grilles, or in other locations. [101:22.3.4.4.2.2]

13.7.2.11.4.2.3

The equivalent performance of the design permitted by 13.7.2.11.4.2.2 shall be acceptable to the AHJ in accordance with the equivalency concepts specified in Section 1.4. [101:22.3.4.4.2.3]

13.7.2.11.4.3\*

Smoke detectors shall not be required in Use Condition II open dormitories where staff is present within the dormitory whenever the dormitory is occupied. [101:22.3.4.4.3]

13.7.2.12 Existing Detention and Correctional Occupancies

13.7.2.12.1 General

Existing detention and correctional occupancies shall be provided with a fire alarm system in accordance with Section 13.7 and 13.7.2.12, except as modified by 13.7.2.12.2 through 13.7.2.12.4.4. [101:23.3.4.1]

13.7.2.12.2 Initiation

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7 and by means of any required detection devices or detection systems, unless otherwise permitted by the following:

Manual fire alarm boxes shall be permitted to be locked, provided that staff is present within the area when it is occupied and staff has keys readily available to unlock the boxes.

Manual fire alarm boxes shall be permitted to be located in a staff location, provided that both of the following criteria are met:

The staff location is attended when the building is occupied.

The staff attendant has direct supervision of the sleeping area.

[101:23.3.4.2]

13.7.2.12.3 Notification

13.7.2.12.3.1 Occupant Notification

Occupant notification shall be accomplished automatically in accordance with 13.7.1.9, and the following also shall apply:

A positive alarm sequence shall be permitted in accordance with 13.7.1.9.5.

\* Any smoke detectors required by this chapter shall be permitted to be arranged to alarm at a constantly attended location only and shall not be required to accomplish general occupant notification.

[101:23.3.4.3.1]

13.7.2.12.3.2 Emergency Forces Notification

13.7.2.12.3.2.1

Fire department notification shall be accomplished in accordance with 13.7.1.10, unless otherwise permitted by one of the following:

A positive alarm sequence shall be permitted in accordance with 13.7.1.9.5.

Any smoke detectors required by this chapter shall not be required to transmit an alarm to the fire department.

This requirement shall not apply where staff is provided at a constantly attended location that meets one of the following criteria:

It has the capability to promptly notify the fire department.

It has direct communication with a control room having direct access to the fire department.

[101:23.3.4.3.2.1]

13.7.2.12.3.2.2

Where the provision of 13.7.2.12.3.2.1(3) is utilized, the fire plan, as required by 20.7.2.1.3, shall include procedures for logging of alarms and immediate notification of the fire department. [101:23.3.4.3.2.2]

13.7.2.12.4 Detection

An approved automatic smoke detection system shall be in accordance with Section 13.7, as modified by 13.7.2.12.4.1 through 13.7.2.12.4.4, throughout all resident housing areas. [101:23.3.4.4]

13.7.2.12.4.1

Smoke detectors shall not be required in sleeping rooms with four or fewer occupants in Use Condition II or Use Condition III. [101:23.3.4.4.1]

13.7.2.12.4.2

Other arrangements and positioning of smoke detectors shall be permitted to prevent damage or tampering, or for other purposes. [101:23.3.4.4.2]

13.7.2.12.4.2.1

Other arrangements, as specified in 13.7.2.12.4.2, shall be capable of detecting any fire, and the placement of detectors shall be such that the speed of detection is equivalent to that provided by the spacing and arrangements required by the installation standards referenced in Section 13.7. [101:23.3.4.4.2.1]

13.7.2.12.4.2.2

Detectors shall be permitted to be located in exhaust ducts from cells, behind grilles, or in other locations. [101:23.3.4.4.2.2]

13.7.2.12.4.2.3

The equivalent performance of the design permitted by 13.7.2.12.4.2.2 shall be acceptable to the AHJ in accordance with the equivalency concepts specified in Section 1.4. [101:23.3.4.4.2.3]

13.7.2.12.4.3\*

Smoke detectors shall not be required in Use Condition II open dormitories where staff is present within the dormitory whenever the dormitory is occupied and the building is protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.13.2. [101:23.3.4.4.3]

13.7.2.12.4.4

In smoke compartments protected throughout by an approved automatic sprinkler system in accordance with 13.3.2.13.2, smoke detectors shall not be required, except in corridors, common spaces, and sleeping rooms with more than four occupants. [101:23.3.4.4.4]

13.7.2.13 New and Existing One- And Two-Family Dwellings

13.7.2.13.1

Smoke alarms or a smoke detection system shall be provided in accordance with either 13.7.2.13.1.1 or 13.7.2.13.1.2, as modified by 13.7.2.13.1.3. [101:24.3.4.1]

13.7.2.13.1.1\*

Smoke alarms shall be installed in accordance with 13.7.1.8 in all of the following locations:

All sleeping rooms

\* Outside of each separate sleeping area, in the immediate vicinity of the sleeping rooms

On each level of the dwelling unit, including basements

[101:24.3.4.1.1]

13.7.2.13.1.2

Dwelling units shall be protected by an approved smoke detection system in accordance with Section 13.7 and equipped with an approved means of occupant notification. [101:24.3.4.1.2]

13.7.2.13.1.3

In existing one- and two-family dwellings, approved smoke alarms powered by batteries shall be permitted. [101:24.3.4.1.3]

13.7.2.13.2 Carbon Monoxide and Carbon Monoxide Detection Systems

13.7.2.13.2.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.13.2 shall be provided in new one- and two-family dwellings where either of the following conditions exists:

Dwelling units with communicating attached garages, unless otherwise exempted by 13.7.2.13.2.3

Dwelling units containing fuel-burning appliances or fuel-burning fireplaces

[101:24.3.4.2.1]

13.7.2.13.2.2\*

Where required by 13.7.2.13.2.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:

Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms

On every occupiable level of a dwelling unit, including basements, and excluding attics and crawl spaces

[101:24.3.4.2.2]

13.7.2.13.2.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.13.2.1(1) shall not be required in the following locations:

In garages

Within dwelling units with communicating attached garages that are open parking structures as defined by the building code

Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:24.3.4.2.3]

13.7.2.14 New and Existing Lodging or Rooming Houses

13.7.2.14.1 General

13.7.2.14.1.1

New and existing lodging and rooming houses, other than those meeting 13.7.2.14.1.2, shall be provided with a fire alarm system in accordance with Section 13.7. [101:26.3.4.1.1]

13.7.2.14.1.2

A fire alarm system in accordance with Section 13.7 shall not be required in existing lodging and rooming houses that have an existing smoke detection system meeting or exceeding the requirements of 13.7.2.14.5.1 where that detection system includes not less than one manual fire alarm box per floor arranged to initiate the smoke detection alarm. [101:26.3.4.1.2]

13.7.2.14.2 Initiation

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7, or by alarm initiation in accordance with 13.7.1.7.1(3) in buildings protected throughout by an approved automatic sprinkler system in accordance with 13.3.2.18. [101:26.3.4.2]

13.7.2.14.3 Notification

Occupant notification shall be provided automatically in accordance with 13.7.1.9, as modified by 13.7.2.14.3.1 and 13.7.2.14.3.2. [101:26.3.4.3]

13.7.2.14.3.1\*

Visible signals for the hearing impaired shall not be required where the proprietor resides in the building and there are five or fewer rooms for rent. [101:26.3.4.3.1]

13.7.2.14.3.2

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:26.3.4.3.2]

13.7.2.14.4 Detection. (Reserved)

13.7.2.14.5 Smoke Alarms

13.7.2.14.5.1

Approved smoke alarms, other than existing smoke alarms meeting the requirements of 13.7.2.14.5.3, shall be installed in accordance with 13.7.1.8 in every sleeping room. [101:26.3.4.5.1]

13.7.2.14.5.2

In other than existing buildings, the smoke alarms required by 13.7.2.14.5.1 shall be interconnected in accordance with 13.7.1.8.4. [101:26.3.4.5.2]

13.7.2.14.5.3

Existing battery-powered smoke alarms, rather than house electric-powered smoke alarms, shall be permitted where the facility has demonstrated to the AHJ that the testing, maintenance, and battery replacement programs will ensure reliability of power to the smoke alarms. [101:26.3.4.5.3]

13.7.2.14.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.14.6.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.14.6 shall be provided in new lodging or rooming houses where either of the following conditions exists:

Lodging or rooming houses with communicating attached garages, unless otherwise exempted by 13.7.2.14.6.3

Lodging or rooming houses containing fuel-burning appliances or fuel-burning fireplaces

[101:26.3.4.6.1]

13.7.2.14.6.2\*

Where required by 13.7.2.14.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:

Outside of each separate sleeping area in the immediate vicinity of the sleeping rooms

On every occupiable level, including basements, and excluding attics and crawl spaces

[101:26.3.4.6.2]

13.7.2.14.6.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.14.6.1(1) shall not be required in the following locations:

In garages

Within lodging or rooming houses with communicating attached garages that are open parking structures as defined by the building code

Within lodging or rooming houses with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:26.3.4.6.3]

13.7.2.15 New Hotels and Dormitories

13.7.2.15.1 General

A fire alarm system in accordance with Section 13.7, except as modified by 13.7.2.15.2 through 13.7.2.15.6, shall be provided. [101:28.3.4.1]

13.7.2.15.2 Initiation

The required fire alarm system shall be initiated by each of the following:

Manual means in accordance with 13.7.1.7

Manual fire alarm box located at the hotel desk or other convenient central control point under continuous supervision by responsible employees

Required automatic sprinkler system

Required automatic detection system other than sleeping room smoke detectors

[101:28.3.4.2]

13.7.2.15.3 Notification

13.7.2.15.3.1\*

Occupant notification shall be provided automatically in accordance with 13.7.1.9. [101:28.3.4.3.1]

13.7.2.15.3.2

In hotels and dormitories that are required by 13.7.2.15 to have a fire alarm system, the audible alarm notification signal provided in sleeping rooms of guest rooms or guest suites that is activated by the fire alarm system shall be a 520 Hz low-frequency signal in accordance with 13.7.1.8.3. [101:28.3.4.3.2]

13.7.2.15.3.3

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:28.3.4.3.3]

13.7.2.15.3.4\*

Guest rooms and guest suites specifically required and equipped to accommodate hearing-impaired individuals shall be provided with a visible notification appliance. [101:28.3.4.3.4]

13.7.2.15.3.5

In occupiable areas, other than guest rooms and guest suites, visible notification appliances shall be provided. [101:28.3.4.3.5]

13.7.2.15.3.6

Annunciation and annunciation zoning in accordance with 13.7.1.13 shall be provided in buildings three or more stories in height or having more than 50 guest rooms or guest suites. Annunciation shall be provided at a location readily accessible from the primary point of entry for emergency response personnel. [101:28.3.4.3.6]

13.7.2.15.3.7

Emergency forces notification shall be provided in accordance with 13.7.1.10. [101:28.3.4.3.7]

13.7.2.15.4 Detection

A corridor smoke detection system in accordance with Section 13.7 shall be provided in buildings other than those protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.7.2.15. [101:28.3.4.5]

13.7.2.15.5\* Smoke Alarms

Smoke alarms shall be installed in accordance with 13.7.1.8 in every guest room and every living area and sleeping room within a guest suite. [101:28.3.4.6]

13.7.2.15.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.15.6.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.15.6 shall be provided in new hotels and dormitories where either of the following conditions exists:

Guest rooms or guest suites with communicating attached garages, unless otherwise exempted by 13.7.2.15.6.3

Guest rooms or guest suites containing a permanently installed fuel-burning appliance or fuel-burning fireplace

[101:28.3.4.7.1]

13.7.2.15.6.2

Where required by 13.7.2.15.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed on every occupiable level of a guest room and guest suite and in the immediate vicinity of the sleeping rooms. [101:28.3.4.7.2]

13.7.2.15.6.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.15.6.1(1) shall not be required in the following locations:

In garages

Within guest rooms or guest suites with communicating attached garages that are open parking structures as defined by the building code

Within guest rooms or guest suites with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:28.3.4.7.3]

13.7.2.15.6.4

Where fuel-burning appliances or fuel-burning fireplaces are installed outside guest rooms or guest suites, carbon monoxide detectors shall be installed in accordance with the manufacturer's published instructions in the locations specified as follows:

On the ceilings of rooms containing permanently installed fuel-burning appliances or fuel-burning fireplaces

Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuel-burning HVAC system

Centrally located within occupiable spaces adjacent to a communicating attached garage

[101:28.3.4.7.4]

13.7.2.15.6.5

Where carbon monoxide detectors are installed in accordance with 13.7.2.15.6.4(1), the alarm signal shall be automatically transmitted to an approved on-site location or to an off-premises location in accordance with NFPA 72. [101:28.3.4.7.5]

13.7.2.15.7 Risk Analysis for Mass Notification

13.7.2.15.7.1

A risk analysis in accordance with 13.7.1.15 shall be performed for grade K through 12, college, or university dormitories with an occupant load greater than 100 to determine if a mass notification system is required. [101:28.3.4.4.1]

13.7.2.15.7.2

Applicable portions of an existing risk analysis shall be permitted to be used when a new building is added to the campus. [101:28.3.4.4.2]

13.7.2.16 Existing Hotels and Dormitories

13.7.2.16.1 General

A fire alarm system in accordance with Section 13.7, except as modified by 13.7.2.16.2 through 13.7.2.16.3.5, shall be provided in buildings, other than those where each guest room has exterior exit access in accordance with 14.10.3 and the building is three or fewer stories in height. [101:29.3.4.1]

13.7.2.16.2 Initiation

The required fire alarm system shall be initiated by each of the following:

Manual means in accordance with 13.7.1.7, unless there are other effective means to activate the fire alarm system, such as complete automatic sprinkler or automatic detection systems, with manual fire alarm box in accordance with 13.7.2.16.2(2) required

Manual fire alarm box located at the hotel desk or other convenient central control point under continuous supervision by responsible employees

Required automatic sprinkler system

Required automatic detection system other than sleeping room smoke detectors

[101:29.3.4.2]

13.7.2.16.3 Notification

13.7.2.16.3.1

Occupant notification shall be provided automatically in accordance with 13.7.1.9. [101:29.3.4.3.1]

13.7.2.16.3.2

Positive alarm sequence in accordance with 13.7.1.9.5, and a presignal system in accordance with 13.7.1.9.4, shall be permitted. [101:29.3.4.3.2]

13.7.2.16.3.3 Reserved

13.7.2.16.3.4 Reserved

13.7.2.16.3.5 Reserved

13.7.2.16.3.6\*

Where the existing fire alarm system does not provide for automatic emergency forces notification in accordance with 13.7.1.10, provisions shall be made for the immediate notification of the public fire department by telephone or other means in case of fire, and, where there is no public fire department, notification shall be made to the private fire brigade. [101:29.3.4.3.6]

13.7.2.16.3.7

Where a new fire alarm system is installed or the existing fire alarm system is replaced, emergency forces notification shall be provided in accordance with 13.7.1.10. [101:29.3.4.3.7]

13.7.2.16.4 Detection. (Reserved)

13.7.2.16.5\* Smoke Alarms

An approved single-station smoke alarm shall be installed in accordance with 13.7.1.8 in every guest room and every living area and sleeping room within a guest suite. [101:29.3.4.5]

13.7.2.16.5.1

The smoke alarms shall not be required to be interconnected. [101:29.3.4.5.1]

13.7.2.16.5.2

Single-station smoke alarms without a secondary (standby) power source shall be permitted. [101:29.3.4.5.2]

13.7.2.16.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.16.6.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.16.6 shall be provided in existing hotels and dormitories where either of the following conditions exists:

Guest rooms or guest suites with communicating attached garages, unless otherwise exempted by 13.7.2.16.6.3

Guest rooms or guest suites containing a permanently installed fuel-burning appliance or fuel-burning fireplace

[101:29.3.4.6.1]

13.7.2.16.6.2

Where required by 13.7.2.16.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed on every occupiable level of a guest room and guest suite and in the immediate vicinity of the sleeping rooms. [101:29.3.4.6.2]

13.7.2.16.6.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.16.6.1(1) shall not be required in the following locations:

In garages

Within guest rooms or guest suites with communicating attached garages that are open parking structures as defined by the building code

Within guest rooms or guest suites with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:29.3.4.6.3]

13.7.2.16.6.4

Where fuel-burning appliances or fuel-burning fireplaces are installed outside guest rooms or guest suites, carbon monoxide detectors shall be installed in accordance with the manufacturer's published instructions in the locations specified as follows:

On the ceilings of rooms containing permanently installed fuel-burning appliances or fuel-burning fireplaces

Centrally located within occupiable spaces served by the first supply air register from a permanently installed, fuel-burning HVAC system

Centrally located within occupiable spaces adjacent to a communicating attached garage

[101:29.3.4.6.4]

13.7.2.16.6.5

Where carbon monoxide detectors are installed in accordance with 13.7.2.16.6.4, the alarm signal shall be automatically transmitted to an approved on-site location or to an off-premises location in accordance with NFPA 72. [101:29.3.4.6.5]

13.7.2.17 New Apartment Buildings

13.7.2.17.1 General

13.7.2.17.1.1

New apartment buildings four or more stories in height or with more than 11 dwelling units, other than those meeting the requirements of 13.7.2.17.1.2, shall be provided with a fire alarm system in accordance with Section 13.7, except as modified by 13.7.2.17.2 through 13.7.2.17.6. [101:30.3.4.1.1]

13.7.2.17.1.2

A fire alarm system shall not be required in buildings where each dwelling unit is separated from other contiguous dwelling units by fire barriers (see Section 12.7) having a minimum 1-hour fire resistance rating, and where each dwelling unit has either its own independent exit or its own independent stairway or ramp discharging at the finished ground level. [101:30.3.4.1.2]

13.7.2.17.2 Initiation

13.7.2.17.2.1

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7, unless the building complies with 13.7.2.17.2.2. [101:30.3.4.2.1]

13.7.2.17.2.2

Initiation of the required fire alarm system by manual means shall not be required in buildings four or fewer stories in height, containing not more than 16 dwelling units, and protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 13.3.2.16. [101:30.3.4.2.2]

13.7.2.17.2.3

In buildings protected throughout by an approved, supervised automatic sprinkler system in accordance with 13.3.2.16, required fire alarm systems shall be initiated upon operation of the automatic sprinkler system. [101:30.3.4.2.3]

13.7.2.17.3 Notification

13.7.2.17.3.1

Occupant notification shall be provided automatically in accordance with Section 13.7, and both of the following shall also apply:

Visible signals shall be installed in units designed for the hearing impaired.

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

[101:30.3.4.3.1]

13.7.2.17.3.2\*

In apartment buildings that are required by 13.7.2.17.1 to have a fire alarm system, the audible alarm notification signal provided in sleeping rooms of dwelling units that is activated by the fire alarm system shall be a 520 Hz low-frequency signal in accordance with 13.7.1.9.9. [101:30.3.4.3.2]

13.7.2.17.3.3

Annunciation, and annunciation zoning, in accordance with 13.7.1.13 shall be provided, unless the building complies with either 13.7.2.17.3.4 or 13.7.2.17.3.5. Annunciation shall be provided at a location readily accessible from the primary point of entry for emergency response personnel. [101:30.3.4.3.3]

13.7.2.17.3.4

Annunciation, and annunciation zoning, shall not be required in buildings two or fewer stories in height and having not more than 50 dwelling units. [101:30.3.4.3.4]

13.7.2.17.3.5

Annunciation, and annunciation zoning, shall not be required in buildings four or fewer stories in height containing not more than 16 dwelling units and protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 13.3.2.16. [101:30.3.4.3.5]

13.7.2.17.3.6

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:30.3.4.3.6]

13.7.2.17.4 Detection. (Reserved)

13.7.2.17.5\* Smoke Alarms

Smoke alarms shall be installed in accordance with 13.7.1.8 in every sleeping area, outside every sleeping area in the immediate vicinity of the bedrooms, and on all levels of the dwelling unit, including basements. [101:30.3.4.5]

13.7.2.17.5.1\*

In apartment buildings that are required by 13.7.2.17 to have a fire alarm system, the audible alarm notification signal provided in sleeping rooms that is activated by smoke alarms shall be a 520 Hz low-frequency signal in accordance with 13.7.1.8.3. [101:30.3.4.5.1]

13.7.2.17.6 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.17.6.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.17.6 shall be provided in new apartment buildings where either of the following conditions exists:

Dwelling units with communicating attached garages, unless otherwise exempted by 13.7.2.17.6.3

Dwelling units containing a permanently installed fuel-burning appliance or fuel-burning fireplace

[101:30.3.4.6.1]

13.7.2.17.6.2

Where required by 13.7.2.17.6.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:

Outside of each separate dwelling unit sleeping area in the immediate vicinity of the sleeping rooms

On every occupiable level of a dwelling unit

[101:30.3.4.6.2]

13.7.2.17.6.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.17.6.1(1) shall not be required in the following locations:

In garages

Within dwelling units with communicating attached garages that are open parking structures as defined by the building code

Within dwelling units with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:30.3.4.6.3]

13.7.2.17.6.4\*

Where fuel-burning appliances or fuel-burning fireplaces are installed outside dwelling units, carbon monoxide detectors shall be installed in accordance with the manufacturer's published instructions in the locations specified as follows:

On the ceilings of rooms containing permanently installed fuel-burning appliances or fuel-burning fireplaces

Centrally located position within occupiable spaces served by the first supply air register from a permanently installed, fuel-burning HVAC system

Centrally located position within occupiable spaces adjacent to a communicating attached garage

[101:30.3.4.6.4]

13.7.2.17.6.5

Where carbon monoxide detectors are installed in accordance with 13.7.2.17.6.4(1), the alarm signal shall be automatically transmitted to an approved on-site location or to an off-premises location in accordance with NFPA 72. [101:30.3.4.6.5]

13.7.2.18 Existing Apartment Buildings

13.7.2.18.1 General

13.7.2.18.1.1

Existing apartment buildings four or more stories in height or with more than 11 dwelling units, other than those meeting the requirements of 13.7.2.18.1.2, shall be provided with a fire alarm system in accordance with Section 13.7, except as modified by 13.7.2.18.1.2 through 13.7.2.18.5. [101:31.3.4.1.1]

13.7.2.18.1.2

A fire alarm system shall not be required where each dwelling unit is separated from other contiguous dwelling units by fire barriers (see Section 12.7) having a minimum 1/2-hour fire resistance rating, and where each dwelling unit has either its own independent exit or its own independent stairway or ramp discharging at the finished ground level. [101:31.3.4.1.2]

13.7.2.18.2 Initiation

13.7.2.18.2.1

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7, unless the building complies with 13.7.2.18.2.2. [101:31.3.4.2.1]

13.7.2.18.2.2

Initiation of the required fire alarm system by manual means shall not be required in buildings four or fewer stories in height, containing not more than 16 dwelling units, and protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 13.7.2.18. [101:31.3.4.2.2]

13.7.2.18.2.3

In buildings using Option 2 as defined by NFPA 101, the required fire alarm system shall be initiated by the automatic fire detection system in addition to the manual initiation means of 13.7.2.18.2.1. [101:31.3.4.2.3]

13.7.2.18.2.4

In buildings using Option 3 as defined by NFPA 101, the required fire alarm system shall be initiated upon operation of the automatic sprinkler system in addition to the manual initiation means of 13.7.2.18.2.1. [101:31.3.4.2.4]

13.7.2.18.2.5

In buildings using Option 4 as defined by NFPA 101, the required fire alarm system shall be initiated upon operation of the automatic sprinkler system in addition to the manual initiation means of 13.7.2.18.2.1. [101:31.3.4.2.5]

13.7.2.18.3 Notification

13.7.2.18.3.1

Occupant notification shall be provided automatically in accordance with Section 13.7, and all of the following shall also apply:

Visible signals shall be installed in units designed for the hearing impaired.

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

Existing approved presignal systems shall be permitted in accordance with 13.7.1.9.4.

[101:31.3.4.3.1]

13.7.2.18.3.2

An annunciator panel, whose location shall be approved by the AHJ, connected with the required fire alarm system shall be provided, unless the building meets the requirements of 13.7.2.18.3.3 or 13.7.2.18.3.4. [101:31.3.4.3.2]

13.7.2.18.3.3

Annunciation shall not be required in buildings two or fewer stories in height and having not more than 50 rooms. [101:31.3.4.3.3]

13.7.2.18.3.4

Annunciation shall not be required in buildings four or fewer stories in height containing not more than 16 dwelling units and protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 13.3.2.17. [101:31.3.4.3.4]

13.7.2.18.3.5

Emergency forces notification shall be accomplished in accordance with 13.7.1.10. [101:31.3.4.3.5]

13.7.2.18.4 Detection

13.7.2.18.4.1\*

In buildings using Option 2 as defined by NFPA 101, a complete automatic fire detection system in accordance with 9.6.1.3 of NFPA 101 and 13.7.2.18.4.2 shall be required. [101:31.3.4.4.1]

13.7.2.18.4.2

Automatic fire detection devices shall be installed as follows:

Smoke detectors shall be installed in all common areas and work spaces outside the living unit, such as exit stairs, egress corridors, lobbies, storage rooms, equipment rooms, and other tenantless spaces in environments that are suitable for proper smoke detector operation.

Heat detectors shall be located within each room of the living unit.

[101:31.3.4.4.2]

13.7.2.18.5 Smoke Alarms

13.7.2.18.5.1\*

In buildings other than those equipped throughout with an existing, complete automatic smoke detection system, smoke alarms shall be installed in accordance with 13.7.1.8, as modified by 13.7.2.18.5.2, outside every sleeping area in the immediate vicinity of the bedrooms and on all levels of the dwelling unit, including basements. [101:31.3.4.5.1]

13.7.2.18.5.2

Smoke alarms required by 13.7.2.18.5.1 shall not be required to be provided with a secondary (standby) power source. [101:31.3.4.5.2]

13.7.2.18.5.3

In buildings other than those equipped throughout with an existing, complete automatic smoke detection system or a complete, supervised automatic sprinkler system in accordance with 13.3.2.17, smoke alarms shall be installed in every sleeping area in accordance with 13.7.1.8, as modified by 13.7.2.18.5.4. [101:31.3.4.5.3]

13.7.2.18.5.4

Smoke alarms required by 13.7.2.18.5.3 shall be permitted to be battery powered. [101:31.3.4.5.4]

13.7.2.19 New, Small (Not More Than 16 Residents) Residential Board and Care Occupancies

13.7.2.19.1 General

A fire alarm system shall be provided in accordance with Section 13.7. [101:32.2.3.4.1]

13.7.2.19.2 Initiation

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7.1(1). [101:32.2.3.4.2]

13.7.2.19.3 Occupant Notification

Occupant notification shall be provided automatically, without delay, in accordance with 13.7.1.9. [101:32.2.3.4.3]

13.7.2.19.4 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.19.4.1

Carbon monoxide alarms or carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.19.4 shall be provided in new, small board and care facilities where either of the following conditions exists:

Where small board and care facilities have communicating attached garages, unless otherwise exempted by 13.7.2.19.4.3

Where small board and care facilities contain fuel-burning appliances or fuel-burning fireplaces

[101:32.2.3.4.4.1]

13.7.2.19.4.2

Where required by 13.7.2.19.4.1, carbon monoxide alarms or carbon monoxide detectors shall be installed in the following locations:

Outside each separate sleeping area in the immediate vicinity of the sleeping rooms

Within sleeping rooms containing fuel-burning appliances or fuel-burning fireplaces

On every occupiable level, including basements and excluding attics and crawl spaces

Centrally located within occupiable spaces adjacent to a communicating attached garage, unless otherwise exempted by 13.7.2.19.4.3

[101:32.2.3.4.4.2]

13.7.2.19.4.3

Carbon monoxide alarms and carbon monoxide detectors as specified in 13.7.2.19.4.1(1) shall not be required in the following locations:

In garages

Within small board and care facilities with communicating attached garages that are open parking structures as defined by the building code

Within small board and care facilities with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:32.2.3.4.4.3]

13.7.2.19.5 Smoke Alarms

13.7.2.19.5.1

Approved smoke alarms shall be provided in accordance with 13.7.1.8. [101:32.2.3.4.5.1]

13.7.2.19.5.2

Smoke alarms shall be installed on all levels, including basements but excluding crawl spaces and unfinished attics. [101:32.2.3.4.5.2]

13.7.2.19.5.3

Additional smoke alarms shall be installed in all living areas, as defined in 3.3.22.5 of NFPA 101. [101:32.2.3.4.5.3]

13.7.2.19.5.4

Each sleeping room shall be provided with an approved smoke alarm in accordance with 13.7.1.8. [101:32.2.3.4.5.4]

13.7.2.20 New, Large (More Than 16 Residents) Residential Board and Care Occupancies

13.7.2.20.1 General

A fire alarm system shall be provided in accordance with Section 13.7. [101:32.3.3.4.1]

13.7.2.20.2 Initiation

The required fire alarm system shall be initiated by each of the following:

Manual means in accordance with 13.7.1.7

Manual fire alarm box located at a convenient central control point under continuous supervision of responsible employees

Required automatic sprinkler system

Required detection system

[101:32.3.3.4.2]

13.7.2.20.3 Annunciator Panel

An annunciator panel, connected to the fire alarm system, shall be provided at a location readily accessible from the primary point of entry for emergency response personnel. [101:32.3.3.4.3]

13.7.2.20.4 Occupant Notification

Occupant notification shall be provided automatically, without delay, in accordance with 13.7.1.9. [101:32.3.3.4.4]

13.7.2.20.5 High-Rise Buildings

High-rise buildings shall be provided with an approved emergency voice communication/alarm system in accordance with 13.7.2.29.3. [101:32.3.3.4.5]

13.7.2.20.6\* Emergency Forces Notification

Emergency forces notification shall meet the following requirements:

Emergency forces notification shall be accomplished in accordance with 13.7.1.10.

Smoke detection devices or smoke detection systems shall be permitted to initiate a positive alarm sequence in accordance with 13.7.1.9.5 for not more than 120 seconds.

[101:32.3.3.4.6]

13.7.2.20.7 Smoke Alarms

13.7.2.20.7.1

Approved smoke alarms shall be installed in accordance with 13.7.1.8 inside every sleeping room, outside every sleeping area in the immediate vicinity of the bedrooms, and on all levels within a resident unit. [101:32.3.3.4.7.1]

13.7.2.20.7.2

Smoke alarms shall not be required to be installed in locations where smoke detection is otherwise required per 13.7.2.20.8. [101:32.3.3.4.7.2]

13.7.2.20.8 Smoke Detection Systems

13.7.2.20.8.1

Corridors and spaces open to the corridors, other than those meeting the requirement of 13.7.2.20.8.3, shall be provided with smoke detectors that comply with NFPA 72 and are arranged to initiate an alarm that is audible in all sleeping areas. [101:32.3.3.4.8.1]

13.7.2.20.8.2 Reserved

13.7.2.20.8.3

Smoke detection systems shall not be required in unenclosed corridors, passageways, balconies, colonnades, or other arrangements with one or more sides along the long dimension fully or extensively open to the exterior at all times. [101:32.3.3.4.8.3]

13.7.2.20.9 Carbon Monoxide Alarms and Carbon Monoxide Detection Systems

13.7.2.20.9.1

Carbon monoxide detectors in accordance with 13.7.1.14 and 13.7.2.20.9 shall be provided in new large board and care facilities where either of the following conditions exists:

Where facilities have communicating attached garages, unless otherwise exempted by 13.7.2.20.9.3

Where fuel-burning appliances or fuel-burning fireplaces are in the facility

[101:32.3.3.4.9.1]

13.7.2.20.9.2

Where required by 13.7.2.20.9.1, carbon monoxide detectors shall be installed in the following locations:

Within rooms containing fuel-burning appliances or fuel-burning fireplaces, unless otherwise exempted by 13.7.2.20.9.4

Centrally located within occupiable spaces served by the first supply air register from a fuel-burning HVAC system

On every occupiable level

Within adjacent communicating occupiable spaces to an attached garage, unless otherwise exempted by 13.7.2.20.9.3

[101:32.3.3.4.9.2]

13.7.2.20.9.3

Carbon monoxide detectors as specified in 13.7.2.20.9.1(1) shall not be required in the following locations:

In garages

Within facilities with communicating attached garages that are open parking structures as defined by the building code

Within facilities with communicating attached garages that are mechanically ventilated in accordance with the mechanical code

[101:32.3.3.4.9.3]

13.7.2.20.9.4

Within resident units containing fuel-burning appliances or fuel-burning fireplaces, carbon monoxide alarms shall be permitted to be used.[101:32.3.3.4.9.4]

13.7.2.21 Existing, Small (Not More Than 16 Residents) Residential Board and Care Occupancies

13.7.2.21.1 Fire Alarm Systems

A fire alarm system shall be provided in accordance with Section 13.7, unless the provisions of 13.7.2.21.1.1 or 13.7.2.21.1.2 are met. [101:33.2.3.4.1]

13.7.2.21.1.1

A fire alarm system shall not be required where interconnected smoke alarms complying with 13.7.2.21.4 and not less than one manual fire alarm box per floor arranged to continuously sound the smoke detector alarms, are provided. [101:33.2.3.4.1.1]

13.7.2.21.1.2

Other manually activated continuously sounding alarms acceptable to the AHJ shall be permitted in lieu of a fire alarm system. [101:33.2.3.4.1.2]

13.7.2.21.2 Initiation

Initiation of the required fire alarm system shall be by manual means in accordance with 13.7.1.7.1(1). [101:33.2.3.4.2]

13.7.2.21.3 Occupant Notification

Occupant notification shall be in accordance with 13.7.1.9. [101:33.2.3.4.3]

13.7.2.21.4\* Smoke Alarms

13.7.2.21.4.1

Approved smoke alarms shall be provided in accordance with 13.7.1.8, unless otherwise indicated in 13.7.2.21.4.6 and 13.7.2.21.4.7. [101:33.2.3.4.4.1]

13.7.2.21.4.2

Smoke alarms shall be installed on all levels, including basements but excluding crawl spaces and unfinished attics. [101:33.2.3.4.4.2]

13.7.2.21.4.3

Additional smoke alarms shall be installed for living rooms, dens, day rooms, and similar spaces. [101:33.2.3.4.4.3]

13.7.2.21.4.4 Reserved

13.7.2.21.4.5

Smoke alarms shall be powered from the building electrical system and, when activated, shall initiate an alarm that is audible in all sleeping areas. [101:33.2.3.4.4.5]

13.7.2.21.4.6

Smoke alarms in accordance with 13.7.2.21.4.1, 13.7.2.21.4.2, and 13.7.2.21.4.3 shall not be required where buildings are protected throughout by an approved automatic sprinkler system, in accordance with 13.3.2.21.2, that uses quick-response or residential sprinklers, and are protected with approved smoke alarms installed in each sleeping room, in accordance with 13.7.1.8, that are powered by the building electrical system. [101:33.2.3.4.4.6]

13.7.2.21.4.7

Smoke alarms in accordance with 13.7.2.21.4.1, 13.7.2.21.4.2, and 13.7.2.21.4.3 shall not be required where buildings are protected throughout by an approved automatic sprinkler system, in accordance with 13.3.2.21.2, that uses quick-response or residential sprinklers, with existing battery-powered smoke alarms in each sleeping room, and where, in the opinion of the AHJ, the facility has demonstrated that testing, maintenance, and a battery replacement program ensure the reliability of power to the smoke alarms. [101:33.2.3.4.4.7]

13.7.2.22 Existing, Large (More Than 16 Residents) Residential Board and Care Occupancies

13.7.2.22.1 General

A fire alarm system in accordance with Section 13.7 shall be provided, unless all of the following conditions are met:

The facility has an evacuation capability of prompt or slow.

Each sleeping room has exterior exit access in accordance with 14.10.3.

The building does not exceed three stories in height.

[101:33.3.3.4.1]

13.7.2.22.2 Initiation

The required fire alarm system shall be initiated by each of the following means:

Manual means in accordance with 13.7.1.7, unless there are other effective means (such as a complete automatic sprinkler or detection system) for notification of fire as required

Manual fire alarm box located at a convenient central control point under continuous supervision of responsible employees

Automatic sprinkler system, other than that not required by another section of this Code

Required detection system, other than sleeping room smoke alarms

[101:33.3.3.4.2]

13.7.2.22.3 Reserved

13.7.2.22.4 Occupant Notification

Occupant notification shall be provided automatically, without delay, by internal audible alarm in accordance with 13.7.1.9. [101:33.3.3.4.4]

13.7.2.22.5 Reserved

13.7.2.22.6 Emergency Forces Notification

13.7.2.22.6.1\*

Where the existing fire alarm system does not provide for automatic emergency forces notification in accordance with 13.7.1.10, provisions shall be made for the immediate notification of the public fire department by either telephone or other means, or, where there is no public fire department, notification shall be made to the private fire brigade. [101:33.3.3.4.6.1]

13.7.2.22.6.2

Where a new fire alarm system is installed, or the existing fire alarm system is replaced, emergency forces notification shall be provided in accordance with 13.7.1.10. [101:33.3.3.4.6.2]

13.7.2.22.7 Smoke Alarms

Smoke alarms shall be provided in accordance with 13.7.2.22.7.1, 13.7.2.22.7.2, or 13.7.2.22.7.3. [101:33.3.3.4.7]

13.7.2.22.7.1

Each sleeping room shall be provided with an approved smoke alarm in accordance with 13.7.1.8 that is powered from the building electrical system. [101:33.3.3.4.7.1]

13.7.2.22.7.2

Existing battery-powered smoke alarms, rather than building electrical service-powered smoke alarms, shall be accepted where, in the opinion of the AHJ, the facility has demonstrated that testing, maintenance, and battery replacement programs ensure the reliability of power to the smoke alarms. [101:33.3.3.4.7.2]

13.7.2.22.7.3

Sleeping room smoke alarms shall not be required in facilities having an existing corridor smoke detection system that complies with Section 13.7 and is connected to the building fire alarm system. [101:33.3.3.4.7.3]

13.7.2.22.8 Smoke Detection Systems

13.7.2.22.8.1

All living areas, as defined in 3.3.22.5 of NFPA 101, and all corridors shall be provided with smoke detectors that comply with NFPA 72 and are arranged to initiate an alarm that is audible in all sleeping areas, as modified by 13.7.2.22.8.2 and 13.7.2.22.8.3. [101:33.3.3.4.8.1]

13.7.2.22.8.2

Smoke detection systems shall not be required in living areas of buildings having a prompt or slow evacuation capability protected throughout by an approved automatic sprinkler system installed in accordance with 13.7.2.22.1. [101:33.3.3.4.8.2]

13.7.2.22.8.3

Smoke detection systems shall not be required in unenclosed corridors, passageways, balconies, colonnades, or other arrangements with one or more sides along the long dimension fully or extensively open to the exterior at all times. [101:33.3.3.4.8.3]

13.7.2.23 New Mercantile Occupancies

13.7.2.23.1 General

New Class A mercantile occupancies shall be provided with a fire alarm system in accordance with Section 13.7. [101:36.3.4.1]

13.7.2.23.2 Initiation

Initiation of the required fire alarm system shall be by any one of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides protection throughout the building, and the provision of 13.7.1.7.6 shall apply.

Approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides protection throughout the building, and the provision of 13.7.1.7.6 shall apply.

[101:36.3.4.2]

13.7.2.23.3 Notification

13.7.2.23.3.1 Occupant Notification

During all times that the mercantile occupancy is occupied, the required fire alarm system, once initiated, shall perform one of the following functions:

It shall activate an alarm in accordance with 13.7.1.9 throughout the mercantile occupancy.

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

[101:36.3.4.3.1]

13.7.2.23.3.2 Emergency Forces Notification

Emergency forces notification shall be provided and shall include notifying both of the following:

Fire department in accordance with 13.7.1.10

Local emergency organization, if provided

[101:36.3.4.3.2]

13.7.2.24 Existing Mercantile Occupancies

13.7.2.24.1 General

Existing Class A mercantile occupancies shall be provided with a fire alarm system in accordance with Section 13.7. [101:37.3.4.1]

13.7.2.24.2 Initiation

Initiation of the required fire alarm system shall be by one of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides protection throughout the building, and the provision of 13.7.1.7.6 shall apply.

Approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides protection throughout the building, and the provision of 13.7.1.7.6 shall apply.

[101:37.3.4.2]

13.7.2.24.3 Notification

13.7.2.24.3.1 Occupant Notification

During all times that the mercantile occupancy is occupied, the required fire alarm system, once initiated, shall perform one of the following functions:

It shall activate an alarm in accordance with 13.7.1.9 throughout the mercantile occupancy, and both of the following also shall apply:

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

A presignal system in accordance with 13.7.1.9.4 shall be permitted.

Occupant notification shall be made via a voice communication or public address system in accordance with 13.7.1.9.10.2

[101:37.3.4.3.1]

13.7.2.24.3.2 Emergency Forces Notification

Emergency forces notification shall be provided and shall include notifying both of the following:

Fire department in accordance with 13.7.1.10

Local emergency organization, if provided

[101:37.3.4.3.2]

13.7.2.25 New Business Occupancies

13.7.2.25.1 General

A fire alarm system in accordance with Section 13.7 shall be provided in all new business occupancies where any one of the following conditions exists:

The building is three or more stories in height.

The occupancy is subject to 50 or more occupants above or below the level of exit discharge.

The occupancy is subject to 300 or more total occupants.

[101:38.3.4.1]

Upcodes Diagrams

13.7.2.25.2 Initiation

Initiation of the required fire alarm system shall be by any one of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides protection throughout the building and the provision of 13.7.1.7.6 shall apply.

Approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides protection throughout the building and the provision of 13.7.1.7.6 shall apply.

[101:38.3.4.2]

13.7.2.25.3 Occupant Notification

During all times that the building is occupied (see 7.2.1.1.3 of NFPA 101), the required fire alarm system, once initiated, shall perform one of the following functions:

It shall activate a general alarm in accordance with 13.7.1.9

A positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

[101:38.3.4.3]

13.7.2.25.4 Emergency Forces Notification

Emergency forces notification shall be provided and shall include notifying both of the following:

Fire department in accordance with 13.7.1.10

Approved local emergency organization, if provided

[101:38.3.4.4]

13.7.2.25.5\* Risk Analysis for Mass Notification

A risk analysis in accordance with 13.7.1.15 shall be performed for new business occupancies containing a classroom where the building is owned, rented, leased, or operated by a college or university to determine whether a mass notification system is required. [101:38.3.4.5]

13.7.2.25.5.1

A risk analysis to determine the need for a mass notification system in accordance with Section 13.7.1.15 shall be conducted for buildings containing a classroom where the building is owned, rented, leased, or operated by a college or university to determine whether a mass notification system is required. [101:38.3.4.5]

13.7.2.26 Existing Business Occupancies

13.7.2.26.1 General

A fire alarm system in accordance with Section 13.7 shall be provided in all existing business occupancies where any one of the following conditions exists:

The building is three or more stories in height.

The occupancy is subject to 100 or more occupants above or below the level of exit discharge.

The occupancy is subject to 1000 or more total occupants.

[101:39.3.4.1]

13.7.2.26.2 Initiation

Initiation of the required fire alarm system shall be by one of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) that provides protection throughout the building and the provision of 13.7.1.7.6 shall apply.

Approved automatic sprinkler system in accordance with 13.7.1.7.1(3) that provides protection throughout the building and the provision of 13.7.1.7.6 shall apply.

[101:39.3.4.2]

13.7.2.26.3 Occupant Notification

During all times that the building is occupied (see 7.2.1.1.3 of NFPA 101), the required fire alarm system, once initiated, shall perform one of the following functions:

It shall activate a general alarm in accordance with 13.7.1.9, and both of the following also shall apply:

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted.

A presignal system in accordance with 13.7.1.9.4 shall be permitted.

Occupant notification shall be permitted to be made via a voice communication or public address system in accordance with 13.7.1.9.10.2.

[101:39.3.4.3]

13.7.2.26.4 Emergency Forces Notification

Emergency forces notification shall be accomplished in accordance with 13.7.1.10 when the existing fire alarm system is replaced. [101:39.3.4.4]

13.7.2.27 New and Existing Industrial Occupancies

13.7.2.27.1 General

A fire alarm system shall be required in accordance with Section 13.7 for new and existing industrial occupancies, unless the total occupant load of the building is under 100 persons and unless, of these, fewer than 25 persons are above or below the level of exit discharge. [101:40.3.4.1]

13.7.2.27.2 Initiation

Initiation of the required fire alarm system shall be by any of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) throughout the building, plus a minimum of one manual fire alarm box in accordance with 13.7.1.7.6

Approved, supervised automatic sprinkler system in accordance with 13.7.1.7.1(3) throughout the building, plus a minimum of one manual fire alarm box in accordance with 13.7.1.7.6

[101:40.3.4.2]

13.7.2.27.3 Notification

13.7.2.27.3.1

The required fire alarm system shall meet one of the following criteria:

It shall provide occupant notification in accordance with 13.7.1.9.

It shall sound an audible and visible signal in a constantly attended location for the purposes of initiating emergency action.

[101:40.3.4.3.1]

13.7.2.27.3.2

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:40.3.4.3.2]

13.7.2.27.3.3

Existing presignal systems in accordance with 13.7.1.9.4 shall be permitted. [101:40.3.4.3.3]

13.7.2.27.3.4

In high hazard industrial occupancies, as described in 40.1.2.1.3 of NFPA 101, the required fire alarm system shall automatically initiate an occupant evacuation alarm signal in accordance with 13.7.1.9. [101:40.3.4.3.4]

13.7.2.28 New and Existing Storage Occupancies

13.7.2.28.1 General

A fire alarm system shall be required in accordance with Section 13.7 for new and existing storage occupancies, except as modified by 13.7.2.28.1.1, 13.7.2.28.1.2, and 13.7.2.28.1.3. [101:42.3.4.1]

13.7.2.28.1.1

Storage occupancies limited to low-hazard contents shall not be required to have a fire alarm system. [101:42.3.4.1.1]

13.7.2.28.1.2

Storage occupancies with ordinary- or high-hazard contents not exceeding an aggregate floor area of 100,000 ft2 (9300 m2) shall not be required to have a fire alarm system. [101:42.3.4.1.2]

13.7.2.28.1.3

Storage occupancies protected throughout by an approved automatic sprinkler system in accordance with Section 13.3 shall not be required to have a fire alarm system. [101:42.3.4.1.3]

13.7.2.28.2 Initiation

Initiation of the required fire alarm system shall be by any of the following means:

Manual means in accordance with 13.7.1.7.1(1)

Approved automatic fire detection system in accordance with 13.7.1.7.1(2) throughout the building, plus a minimum of one manual fire alarm box in accordance with 13.7.1.7.6

Approved, supervised automatic sprinkler system in accordance with 13.7.1.7.1(3) throughout the building, plus a minimum of one manual fire alarm box in accordance with 13.7.1.7.6

[101:42.3.4.2]

13.7.2.28.3 Notification

13.7.2.28.3.1

The required fire alarm system shall meet one of the following criteria:

It shall provide occupant notification in accordance with 13.7.1.9.

It shall sound an audible and visible signal in a constantly attended location for the purposes of initiating emergency action.

[101:42.3.4.3.1]

13.7.2.28.3.2

Positive alarm sequence in accordance with 13.7.1.9.5 shall be permitted. [101:42.3.4.3.2]

13.7.2.28.3.3

Existing presignal systems in accordance with 13.7.1.9.4 shall be permitted. [101:42.3.4.3.3]

13.7.2.28.3.4

In high-hazard storage occupancies, the required fire alarm system shall automatically initiate an occupant evacuation alarm signal in accordance with 13.7.1.9. [101:42.3.4.3.4]

13.7.2.29 Special Structures and High-Rise Buildings

13.7.2.29.1 Open Structures

Open structures shall be exempt from the requirement for detection, alarm, and communications systems. [101:11.2.3.4]

13.7.2.29.2 Towers

Towers, as defined in 3.3.293 of NFPA 101, designed for occupancy by not more than three persons shall be exempt from requirements for detection, alarm, and communications systems. [101:11.3.3.4]

13.7.2.29.3 New High-Rise Buildings

13.7.2.29.3.1\*

A fire alarm system using an approved emergency voice/alarm communication system shall be installed in accordance with Section 13.7 and NFPA 101. [101:11.8.4.1]

13.7.2.29.3.2

Two-way telephone service shall be in accordance with 13.7.2.29.3.2.1 and 13.7.2.29.3.2.2. [101:11.8.4.2]

13.7.2.29.3.2.1

Two-way telephone communication service shall be provided for fire department use. [101:11.8.4.2.1]

13.7.2.29.3.2.1.1

The two-way telephone communication system shall be in accordance with NFPA 72. [101:11.8.4.2.1.1]

13.7.2.29.3.2.1.2

The two-way telephone communication system shall operate between the emergency command center and every elevator car, every elevator lobby, and each floor level of exit stairs. [101:11.8.4.2.1.2]

13.7.2.29.3.2.2\*

The requirement of 13.7.2.29.3.2.1 shall not apply where the fire department radio system is approved as an equivalent system. [101:11.8.4.2.2]

13.7.2.29.3.2.3 Risk Analysis for Mass Notification Systems

For high-rise buildings with a total occupant load of 5000 or more persons, or where the floor of an occupiable story is greater than 420 ft (128 m) above the lowest level of fire department vehicle access, a risk analysis in accordance with 13.7.1.15 shall be performed to determine whether a mass notification system is required. [101:11.8.4.3]

13.7.2.30 Carbon Monoxide Detectors

13.7.2.30.1

Where required by other governing laws, codes, or standards, carbon monoxide detectors shall be installed in accordance with the following:

\* On the ceiling in the same room as permanently installed fuel-burning appliances, and

\* Centrally located on every habitable level and in every HVAC zone of the building, and

Outside of each separate dwelling unit, guest room, and guest suite sleeping area within 21 ft (6.4 m) of any door to a sleeping room, with the distance measured along a path of travel, and

Other locations where required by applicable laws, codes, or standards, or

A performance-based design in accordance with Section 17.3 of NFPA 72

[72:17.12.1]

13.7.2.30.2

Carbon monoxide detectors shall meet the following requirements:

Carbon monoxide detectors shall be listed in accordance with applicable standards, such as UL 2075, Gas and Vapor Detectors and Sensors.

Carbon monoxide detectors shall be set to respond to the sensitivity limits specified in UL 2034, Single and Multiple Station Carbon Monoxide Alarms.

[72:17.12.2]

13.7.2.30.3

All carbon monoxide detectors shall be located and mounted so that accidental operation will not be caused by jarring or vibration. [72:17.12.3]

13.7.2.30.4

The location of carbon monoxide detectors shall be based on an evaluation of potential ambient sources and flows of carbon monoxide, moisture, temperature, dust, or fumes and of electrical or mechanical influences to minimize nuisance alarms. [72:17.12.4]

13.7.2.30.5

The selection and placement of carbon monoxide detectors shall take into account both the performance characteristics of the detector and the areas into which the detectors are to be installed to prevent nuisance and unintentional alarms or improper operation after installation. [72:17.12.5]

13.7.2.30.6

Unless specifically designed and listed for the expected conditions, carbon monoxide detectors shall not be installed where any of the following ambient conditions exist:

Temperature below 32°F (0°C)

Temperature above 100°F (38°C)

Relative humidity outside the range of 10 percent to 95 percent

[72:17.12.6]

13.7.2.30.7

Unless tested and listed for recessed mounting, carbon monoxide detectors shall not be recessed into the mounting surface. [72:17.12.7]

13.7.2.30.8 Protection During Construction

13.7.2.30.8.1

Where detectors are installed for signal initiation during construction, they shall be replaced prior to the final commissioning of the system. [72:17.12.8.1]

13.7.2.30.8.2

Where detection is not required during construction, detectors shall not be installed until after all other construction trades have completed cleanup. [72:17.12.8.2]

13.7.2.30.9 Carbon Monoxide Detectors for Control of Carbon Monoxide Spread

13.7.2.30.9.1

System designers shall consider the spread of carbon monoxide through an occupancy through the HVAC system. [72:17.12.9.1]

13.7.2.30.9.2

Interaction with smoke control systems, if such is provided, shall be coordinated. [72:17.12.9.2]

13.7.3 Fire Alarm Systems

13.7.3.1 General

13.7.3.1.1 Equipment

13.7.3.1.1.1

Equipment constructed and installed in conformity with this Code shall be listed for the purpose for which it is used. [72:10.3.1]

13.7.3.1.1.2

System components shall be installed, tested, inspected, and maintained in accordance with the manufacturer's published instructions and this Code. [72:10.3.2]

13.7.3.1.1.3\*

All devices and appliances that receive their power from the initiating device circuit or signaling line circuit of a control unit shall be listed for use with the control unit. [72:10.3.3]

13.7.3.1.1.4

All apparatus requiring rewinding or resetting to maintain normal operation shall be restored to normal after each abnormal condition. [72:10.3.4]

13.7.3.2 Documentation and Notification

13.7.3.2.1 Approval and Acceptance

The AHJ shall be notified prior to installation or alteration of equipment or wiring. [72:10.20.2]

13.7.3.2.2 Minimum Required Documentation

13.7.3.2.2.1

Where documentation is required by the authority having jurisdiction, the following list shall represent the minimum documentation required for new systems and additions or alterations to existing systems:

Written narrative providing intent and system description

Riser diagram

Floor plan layout showing locations of all devices, control equipment, and supervising station and shared communications equipment with each sheet showing the following:

Point of compass (north arrow)

A graphic representation of the scale used

Room use identification

Building features that will affect the placement of initiating devices and notification appliances

Sequence of operation in either an input/output matrix or narrative form

Equipment technical data sheets

Manufacturers' published instructions, including operation and maintenance instructions

Battery capacity and safety margin calculations (where batteries are provided)

Voltage drop calculations for notification appliance circuits

Mounting height elevation for wall-mounted devices and appliances

Where occupant notification is required, minimum sound pressure levels that must be produced by the audible notification appliances in applicable covered areas

Locations of alarm notification appliances, including candela ratings for visual alarm notification appliances

Pathway diagrams between the control unit and the supervising station and shared communications equipment within the protected premises

Completed record of completion in accordance with 13.7.3.2.3.6 and 13.7.3.2.6.2

For software-based systems, a copy of site-specific software, including specific instructions on how to obtain the means of system and software access (password)

Record (as-built) drawings

Records, record retention, and record maintenance in accordance with Section 7.7 of NFPA 72

Completed record of inspection and testing in accordance with 13.7.3.2.4.6 and 13.7.3.2.6.2

[72:7.2.1]

13.7.3.2.2.2

System design documents shall identify the name and contact information of the system designer. [72:7.2.2]

13.7.3.2.2.3

All fire alarm drawings shall use symbols described in NFPA 170 or other symbols acceptable to the authority having jurisdiction. [72:7.2.3]

13.7.3.2.3 Completion Documentation

13.7.3.2.3.1

The requirements of 13.7.3.2.3 shall apply only where required by other governing laws, codes, or standards; by other parts of NFPA 72; or by project specifications or drawings. [72:7.5.1]

13.7.3.2.3.2

Before requesting final approval of the installation, if required by the AHJ, the installing contractor shall furnish a written statement stating that the system has been installed in accordance with approved plans and tested in accordance with the manufacturer's published instructions and the appropriate NFPA requirements. [72:7.5.2]

13.7.3.2.3.3

All systems including new systems and additions or alterations to existing systems shall include the following documentation, which shall be delivered to the owner or the owner's representative upon final acceptance of the system:

An owner's manual and manufacturer's published instructions covering all system equipment

Record (as-built) drawings in accordance with 13.7.3.2.3.5

A completed record of completion form in accordance with 13.7.3.2.3.6

For software-based systems, record copy of the site-specific software in accordance with 13.7.3.2.3.7

[72:7.5.3]

13.7.3.2.3.4

For new emergency communications systems, an owner's manual shall be provided and shall contain the following documentation:

Detailed narrative description of the system inputs, evacuation signaling, ancillary functions, annunciation, intended sequence of operations, expansion capability, application considerations, and limitations

Written sequence of operation for the system including an operational input/output matrix

Operator instructions for basic system operations, including alarm acknowledgment, system reset, interpretation of system output (LEDs, CRT display, and printout), operation of manual evacuation signaling and ancillary function controls, and change of printer paper

Detailed description of routine maintenance and testing as required and recommended and as would be provided under a maintenance contract, including testing and maintenance instructions for each type of device installed, which includes the following:

Listing of the individual system components that require periodic testing and maintenance

Step-by-step instructions detailing the requisite testing and maintenance procedures, and the intervals at which those procedures shall be performed, for each type of device installed

Schedule that correlates the testing and maintenance procedures that are required by this section

Service directory, including a list of names and telephone numbers of those who provide service for the system

Product data sheets for all system equipment

[72:7.5.4]

13.7.3.2.3.5 Record Drawings (As-Builts)

13.7.3.2.3.5.1

Record drawings shall consist of current updated shop drawings reflecting the actual installation of all system equipment, components, and wiring. [72:7.5.5.1]

13.7.3.2.3.5.2

A sequence of operations in input/output matrix or narrative form shall be provided with the record drawings to reflect actual programming at the time of completion. [72:7.5.5.2]

13.7.3.2.3.5.3

Where necessary, revised calculations in accordance with 7.4.10 of NFPA 72 shall be provided depicting any changes due to installation conditions. [72:7.5.5.3]

13.7.3.2.3.5.4

Record drawings shall be turned over to the owner with a copy placed inside the documentation cabinet in accordance with Section 7.7 of NFPA 72. [72:7.5.5.4]

13.7.3.2.3.5.5

Record drawings shall include approval documentation resulting from variances, performance-based designs, risk analyses, and other system evaluations or variations. [72:7.5.5.5]

13.7.3.2.3.6 Record of Completion

13.7.3.2.3.6.1

The record of completion shall be documented in accordance with 13.7.3.2.3.6 using either the record of completion forms, Figure 13.7.3.2.5.2(a) through Figure 13.7.3.2.5.2(f), or an alternative document that contains only the elements of Figure 13.7.3.2.5.2(a) through Figure 13.7.3.2.5.2(f) applicable to the installed system. [72:7.5.6.1]

13.7.3.2.3.6.2

The record of completion documentation shall be completed by the installing contractor and submitted to the authority having jurisdiction and the owner at the conclusion of the job. The record of completion documentation shall be permitted to be part of the written statement required in 13.7.3.2.3.2 and part of the documents that support the requirements of 13.7.3.2.3.8. When more than one contractor has been responsible for the installation, each contractor shall complete the portions of the documentation for which that contractor has responsibility. [72:7.5.6.2]

13.7.3.2.3.6.3

The preparation of the record of completion documentation shall be the responsibility of the qualified and experienced person in accordance with 10.5.2 of NFPA 72. [72:7.5.6.3]

13.7.3.2.3.6.4

The record of completion documentation shall be updated in accordance with 13.7.3.2.3.6.6 to reflect all system additions or modifications. [72:7.5.6.4]

13.7.3.2.3.6.5

The updated copy of the record of completion documents shall be maintained in a documentation cabinet in accordance with 7.7.2 of NFPA 72. [72:7.5.6.5]

13.7.3.2.3.6.6 Revisions

13.7.3.2.3.6.6.1

All modifications made after the initial installation shall be recorded on a revised version of the original completion documents, which shall serve as a supplement to the original, unaltered completion documents. [72:7.5.6.6.1]

13.7.3.2.3.6.6.2

The revised record of completion document shall include a revision date. [72:7.5.6.6.2]

13.7.3.2.3.6.6.3

Where the original or the latest overall system record of completion cannot be obtained, a new system record of completion shall be provided that documents the system configuration as discovered during the current project's scope of work. [72:7.5.6.6.3]

13.7.3.2.3.6.7 Electronic Record of Completion

13.7.3.2.3.6.7.1

Where approved by the AHJ, the record of completion shall be permitted to be filed electronically instead of on paper. [72:7.5.6.7.1]

13.7.3.2.3.6.7.2

If filed electronically, the record of completion document shall be accessible with standard software and shall be backed up. [72:7.5.6.7.2]

13.7.3.2.3.7 Site-Specific Software

13.7.3.2.3.7.1

For software-based systems, a copy of the site-specific software shall be provided to the system owner or owner's designated representative. [72:7.5.7.1]

13.7.3.2.3.7.1.1

The site-specific software documentation shall include both the user passcode and either the system programming password or specific instructions on how to obtain the programming password from the system manufacturer. [72:7.5.7.1.1]

13.7.3.2.3.7.1.2

The passwords provided shall enable currently certified qualified programming personnel to access, edit, modify, and add to the existing system site-specific software. [72:7.5.7.1.2]

13.7.3.2.3.7.2

A copy of the site-specific software shall be stored on-site in nonvolatile, nonerasable, nonrewritable memory. [72:7.5.7.2]

13.7.3.2.3.8\* Verification of Compliant Installation

13.7.3.2.3.8.1

Where required by the AHJ, compliance of the completed installation with the requirements of NFPA 72 shall be certified by a qualified and impartial third-party organization acceptable to the AHJ. [72:7.5.8.1]

13.7.3.2.3.8.2

Verification of compliant installation shall be performed according to testing requirements and procedures specified in 14.4.1 and 14.4.2 of NFPA 72. [72:7.5.8.2]

13.7.3.2.3.8.3

Verification shall ensure that:

All components and functions are installed and operate per the approved plans and sequence of operation.

All required system documentation is complete and is archived on site.

For new supervising station systems, the verification shall also ascertain proper arrangement, transmission, and receipt of all signals required to be transmitted off-premises and shall meet the requirements of 14.4.1 and 14.4.2 of NFPA 72.

For existing supervising station systems that are extended, modified, or reconfigured, the verification shall be required for the new work only, and reacceptance testing in accordance with Chapter 14 of NFPA 72 shall be acceptable.

Written confirmation has been provided that any required corrective actions have been completed

[72:7.5.8.3]

13.7.3.2.3.9

Documentation of central station service shall be in accordance with 26.3.4 of NFPA 72. [72:7.5.9]

13.7.3.2.3.10

Documentation of remote station service shall be in accordance with 26.5.2 of NFPA 72. [72:7.5.10]

13.7.3.2.4 Inspection, Testing, and Maintenance Documentation

13.7.3.2.4.1

Test plan documentation shall be provided in accordance with 14.2.10 of NFPA 72. [72:7.6.1]

13.7.3.2.4.2

Acceptance testing documentation shall be provided in accordance with 14.6.1 of NFPA 72. [72:7.6.2]

13.7.3.2.4.3

Reacceptance test documentation shall be provided in accordance with 14.6.1 of NFPA 72. [72:7.6.3]

13.7.3.2.4.4

Periodic inspection and testing documentation shall be provided in accordance with 14.6.2 through 14.6.4 of NFPA 72. [72:7.6.4]

13.7.3.2.4.5

Impairment documentation shall be provided in accordance with Section 10.20 of NFPA 72. [72:7.6.5]

13.7.3.2.4.6 Record of Inspection and Testing

The record of all inspections, testing, and maintenance as required by 14.6.2.4 of NFPA 72 shall be documented using either the record of inspection and testing forms, Figure 13.7.3.2.5.2(g) through Figure 13.7.3.2.5.2(1), or an alternative record that includes all the applicable information shown in Figure 13.7.3.2.5.2(g) through Figure 13.7.3.2.5.2(1). [72:7.6.6]

13.7.3.2.5 Records, Record Retention, and Record Maintenance

13.7.3.2.5.1 Records

13.7.3.2.5.1.1

A complete record of the tests and operations of each system shall be kept until the next test and for 1 year thereafter unless more stringent requirements are required elsewhere in NFPA 72. [72:7.7.1.1]

13.7.3.2.5.1.2\*

The records shall be available for examination and, if required, reported to the authority having jurisdiction. Archiving of records by any means shall be permitted if hard copies of the records can be provided promptly when requested. [72:7.7.1.2]

13.7.3.2.5.1.3

If off-premises monitoring is provided, records of all signals, tests, and operations recorded at the supervising station, including the public emergency alarm reporting system, shall be maintained by the off-premise monitoring service provider for not less than 1 year unless more stringent requirements are required elsewhere in NFPA 72. [72:7.7.1.3]

13.7.3.2.5.1.4

Required documents regarding system design and function shall be maintained for the life of the system. [72:7.7.1.4]

13.7.3.2.5.1.5

The emergency communications system and fire alarm system as-built plans and other related documentation shall be permitted to be maintained together, including the appearance of both systems on the same drawings. [72:7.7.1.5]

13.7.3.2.5.1.6

Revisions and alterations to systems shall be recorded and records maintained with the original system design documents. [72:7.7.1.6]

13.7.3.2.5.2 Document Accessibility

13.7.3.2.5.2.1

With every new system, a documentation cabinet shall be installed at the system control unit or at another approved location at the protected premises. [72:7.7.2.1]

13.7.3.2.5.2.2

The documentation cabinet shall be sized so that it can contain all necessary documentation. [72:7.7.2.2]

13.7.3.2.5.2.3\*

All record documentation shall be stored in the documentation cabinet. No record documentation shall be stored in the control unit. [72:7.7.2.3]

13.7.3.2.5.2.4

Where the documentation cabinet is not in the same location as the system control unit, its location shall be identified at the system control unit. [72:7.7.2.4]

13.7.3.2.5.2.5

The documentation cabinet shall be prominently labeled SYSTEM RECORD DOCUMENTS. [72:7.7.2.5]

13.7.3.2.5.2.6\*

The building owner or the building owner's representative shall, on an annual basis, review any electronic documentation media formats and associated interfacing hardware for compatibility and update, if necessary. [72:7.7.2.6]

13.7.3.2.5.2.7

The contents of the cabinet shall be accessible by authorized personnel only. [72:7.7.2.7]

13.7.3.2.5.2.8

Emergency communications system and fire alarm system record documentation shall be permitted to be maintained together in the same documentation cabinet. [72:7.7.2.8]

13.7.3.2.5.3 Document Security

13.7.3.2.5.3.1

Security for system's documentation shall be determined by the stakeholders. [72:7.7.3.1]

13.7.3.2.5.3.2\*

Where such documents cannot be protected from public access, it shall be permitted to remove sensitive information from record documents provided the owner retains complete documentation that will be made accessible to the authority having jurisdiction at an owner designated location. [72:7.7.3.2]

13.7.3.2.6 Forms

13.7.3.2.6.1 General

13.7.3.2.6.1.1

The requirements of 13.7.3.2.6 shall apply only where required by other governing laws, codes, or standards; by other parts of this Code; or by project specifications or drawings. [72:7.8.1.1]

13.7.3.2.6.1.2

Where specific forms are required by other governing laws, codes, or standards; by other parts of NFPA 72; or by project specifications or drawings, form layouts and content that differ from those in 13.7.3.2.6 shall be permitted provided that the minimum required content is included. [72:7.8.1.2]

13.7.3.2.6.2 Forms for Documentation

Forms for documentation shall comply with Section 7.8.2 of NFPA 72.

13.7.3.3 Manually Actuated Alarm-Initiating Devices

13.7.3.3.1

Manually actuated alarm-initiating devices shall be listed in accordance with applicable standards such as UL 38, Manual Signaling Boxes for Fire Alarm Systems. [72:17.15.1]

13.7.3.3.2

Manually actuated alarm-initiating devices for initiating signals other than for fire alarm shall be permitted if the devices are differentiated from manual fire alarm boxes by a color other than red and labeling. [72:17.15.2]

13.7.3.3.3

Combination manual fire alarm boxes and guard's signaling stations shall be permitted. [72:17.15.3]

13.7.3.3.4

Manually actuated alarm-initiating devices shall be securely mounted. [72:17.15.4]

13.7.3.3.5

Manually actuated alarm-initiating devices shall be mounted on a background of contrasting color. [72:17.15.5]

13.7.3.3.6

The operable part of a manually actuated alarm-initiating device shall be not less than 42 in. (1.07 m) and not more than 48 in. (1.22 m) from the finished floor. [72:17.15.6]

13.7.3.3.7

Manually actuated alarm-initiating devices shall be permitted to be single action or double action. [72:17.15.7]

13.7.3.3.8\*

Listed protective covers shall be permitted to be installed over single- or double-action manually actuated alarm-initiating devices. [72:17.15.8]

13.7.3.3.9

Manual fire alarm boxes shall comply with 13.7.3.3.9.1 through 13.7.3.3.9.6. [72:17.15.9]

13.7.3.3.9.1

Manual fire alarm boxes shall be used only for fire alarm initiating purposes. [72:17.15.9.1]

13.7.3.3.9.2

Manual fire alarm boxes shall be installed so that they are conspicuous, unobstructed, and accessible. [72:17.15.9.2]

13.7.3.3.9.3\*

Unless installed in an environment that precludes the use of red paint or red plastic, manual fire alarm boxes shall be red in color. [72:17.15.9.3]

13.7.3.3.9.4

Manual fire alarm boxes shall be located within 5 ft (1.5 m) of each exit doorway on each floor. [72:17.15.9.4]

13.7.3.3.9.5\*

Additional manual fire alarm boxes shall be provided so that the travel distance to the nearest manual fire alarm box will not exceed 200 ft (61 m), measured horizontally on the same floor. [72:17.15.9.5]

13.7.3.3.9.6

Manual fire alarm boxes shall be mounted on both sides of grouped openings over 40 ft (12.2 m) in width, and within 5 ft (1.5 m) of each side of the grouped opening. [72:17.15.9.6]

13.7.3.3.10

When fire alarm systems are not monitored, an approved permanent sign shall be installed adjacent to each manual fire alarm box. The sign shall read as follows:

Local alarm only:

(1) Activate alarm

(2) Exit building

(3) Call fire department

13.7.3.4\* Indication of Central Station Service

The prime contractor shall conspicuously indicate that the alarm system providing service at a protected premises complies with all the requirements of this Code through the use of a systematic follow-up program under the control of the organization that has listed the prime contractor. [72:26.3.4]

13.7.3.4.1

Documentation indicating Code compliance of the alarm system shall be issued by the organization that has listed the prime contractor. [72:26.3.4.1]

13.7.3.4.2

The documentation shall include, at a minimum, the following information:

Name of the prime contractor involved with the ongoing Code compliance of the central station service

\* Full description of the alarm system as installed

Issue and expiration dates of the documentation

Name, address, and contact information of the organization issuing the document

Identification of the AHJ(s) for the central station service installation

[72:26.3.4.2]

13.7.3.4.3

The documentation shall be physically posted within 3 ft (1 m) of the control unit, and copies of the documentation shall be made available to the AHJ(s) upon request. [72:26.3.4.3]

13.7.3.4.4

A central repository of issued documentation, accessible to the AHJ, shall be maintained by the organization that has listed the prime contractor. [72:26.3.4.4]

13.7.3.4.5\*

Alarm system service that does not comply with all the requirements of Section 26.3 of NFPA 72 shall not be designated as central station service. [72:26.3.4.5]

13.7.3.4.6\*

For the purpose of Section 26.3 of NFPA 72, the subscriber shall notify the prime contractor, in writing, of the identity of the authority(ies) having jurisdiction. [72:26.3.4.6]

13.7.3.4.7

The AHJ(s) identified in 13.7.3.4.2(5) shall be notified within 30 calendar days of the expiration or cancellation by the organization that has listed the prime contractor. [72:26.3.4.7]

13.7.3.4.8

The subscriber shall surrender expired or canceled documentation to the prime contractor within 30 days of the termination date. [72:26.3.4.8]

13.7.3.5 Automatic Fire Detection and Alarm Service

13.7.3.5.1

Automatic fire detectors shall be located, maintained, and tested in accordance with NFPA 72.

13.7.4 Automatic Fire Detectors

13.7.4.1 General Requirements

13.7.4.1.1

The requirements of 13.7.4.1.1 through 13.7.4.1.4 shall apply to all initiating devices. [72:17.4.1]

13.7.4.1.2 Mechanical Protection

13.7.4.1.2.1

Initiating devices subject to mechanical damage shall be protected. [72:17.4.2.1]

13.7.4.1.2.2

If guards or covers are employed, they shall be listed for use with the initiating device. [72:17.4.2.2]

13.7.4.1.2.3\*

The protection shall not prevent the initiating device from achieving the objectives of the system by adversely affecting the use, operation, or performance of the initiating device. [72:17.4.2.3]

13.7.4.1.3

Initiating devices shall be installed in a manner that provides accessibility for periodic inspection, testing, and maintenance. [72:17.4.3]

13.7.4.1.4

Initiating devices shall be installed in all areas, compartments, or locations where required by other governing laws, codes, or standards. [72:17.4.4]

13.7.4.1.5 Duct Detector Installation

13.7.4.1.5.1

Smoke detectors shall be installed, tested, and maintained in accordance with NFPA 72. [90A:6.4.4.1]

13.7.4.1.5.2

In addition to the requirements of 6.4.3 of NFPA 90A where an approved fire alarm system is installed in a building, the smoke detectors required by the provisions of Section 6.4 of NFPA 90A shall be connected to the fire alarm system in accordance with the requirements of NFPA 72. [90A:6.4.4.2]

13.7.4.1.5.2.1

Smoke detectors used solely for closing dampers or for heating, ventilating, and air-conditioning system shutdown shall not be required to activate the building evacuation alarm. [90A:6.4.4.2.1]

13.7.4.1.5.3

Where smoke detectors required by Section 6.4 of NFPA 90A are installed in a building not equipped with an approved fire alarm system as specified by 13.7.4.1.5.2, the following shall occur:

Smoke detector activation required by Section 6.4 of NFPA 90A shall cause a visual signal and an audible signal in a normally occupied area.

Smoke detector trouble conditions shall be indicated visually or audibly in a normally occupied area and shall be identified as air duct detector trouble.

[90A:6.4.4.3]

13.7.4.1.5.4

Smoke detectors powered separately from the fire alarm system for the sole function of stopping fans shall not require standby power. [90A:6.4.4.4]

13.7.4.2 Requirements for Smoke and Heat Detectors

13.7.4.2.1 Recessed Mounting

Unless tested and listed for recessed mounting, detectors shall not be recessed into the mounting surface. [72:17.5.1]

13.7.4.2.2\* Partitions

Where partitions extend to within 15 percent of the ceiling height, the spaces separated by the partitions shall be considered as separate rooms. [72:17.5.2]

13.7.4.3 Location

13.7.4.3.1\*

Unless otherwise modified by 17.6.3.2.2, 17.6.3.3.2, or 17.6.3.7 of NFPA 72, spot-type heat-sensing fire detectors shall be located on the ceiling not less than 4 in. (100 mm) from the sidewall or on the sidewalls between 4 in. and 12 in. (100 mm and 300 mm) from the ceiling. [72:17.6.3.1.3.1]

13.7.4.3.2

Unless otherwise modified by 17.6.3.2.2, 17.6.3.3.2, or 17.6.3.7 of NFPA 72, line-type heat detectors shall be located on the ceiling or on the sidewalls not more than 20 in. (510 mm) from the ceiling. [72:17.6.3.1.3.2]

13.7.4.3.3\* Spot-Type Smoke Detectors

13.7.4.3.3.1\*

Spot-type smoke detectors shall be located on the ceiling or, if on a sidewall, between the ceiling and 12 in. (300 mm) down from the ceiling to the top of the detector. [72:17.7.3.2.1]

13.7.4.3.3.2\*

To minimize dust contamination, smoke detectors, where installed under raised floors, shall be mounted only in an orientation for which they have been listed. [72:17.7.3.2.2]

13.7.4.3.3.3

On smooth ceilings, spacing for spot-type smoke detectors shall be in accordance with 13.7.4.3.3.3.1 through 13.7.4.3.3.3.4. [72:17.7.3.2.3]

13.7.4.3.3.3.1\*

In the absence of specific performance-based design criteria, one of the following requirements shall apply:

The distance between smoke detectors shall not exceed a nominal spacing of 30 ft (9.1 m) and there shall be detectors within a distance of one-half the nominal spacing, measured at right angles from all walls or partitions extending upward to within the top 15 percent of the ceiling height.

\* All points on the ceiling shall have a detector within a distance equal to or less than 0.7 times the nominal 30 ft (9.1 m) spacing (0.7 S).

[72:17.7.3.2.3.1]

13.7.4.3.3.3.2

In all cases, the manufacturer's published instructions shall be followed. [72:17.7.3.2.3.2]

13.7.4.3.3.3.3

Other spacing shall be permitted to be used depending on ceiling height, different conditions, or response requirements. [72:17.7.3.2.3.3]

13.7.4.3.3.3.4

For the detection of flaming fires, the guidelines in Annex B of NFPA 72 shall be permitted to be used. [72:17.7.3.2.3.4]

13.7.4.3.3.4\*

For solid joist and beam construction, spacing for spot-type smoke detectors shall be in accordance with 13.7.4.3.3.4.1 through 13.7.4.3.3.4.5. [72:17.7.3.2.4]

13.7.4.3.3.4.1

Solid joists shall be considered equivalent to beams for smoke detector spacing guidelines. [72:17.7.3.2.4.1]

13.7.4.3.3.4.2

For level ceilings, the following shall apply:

For ceilings with beam depths of less than 10 percent of the ceiling height (0.1 H), the following shall apply:

Smooth ceiling spacing shall be permitted.

Spot-type smoke detectors shall be permitted to be located on ceilings or on the bottom of beams.

For ceilings with beam depths equal to or greater than 10 percent of the ceiling height (0.1 H), the following shall apply:

Where beam spacing is equal to or greater than 40 percent of the ceiling height (0.4 H), spot-type detectors shall be located on the ceiling in each beam pocket.

Where beam spacing is less than 40 percent of the ceiling height (0.4 H), the following shall be permitted for spot detectors:

Smooth ceiling spacing in the direction parallel to the beams and at one-half smooth ceiling spacing in the direction perpendicular to the beams

Location of detectors either on the ceiling or on the bottom of the beams

\* For beam pockets formed by intersecting beams, including waffle or pan-type ceilings, the following shall apply:

For beam depths less than 10 percent of the ceiling height (0.1 H), spacing shall be in accordance with 13.7.4.3.3.4.2(1).

For beam depths greater than or equal to 10 percent of the ceiling height (0.1 H), spacing shall be in accordance with 13.7.4.3.3.4.2(2) (b).

\* For corridors 15 ft (4.6 m) in width or less having ceiling beams or solid joists perpendicular to the corridor length, the following shall apply:

Smooth ceiling spacing shall be permitted.

Location of spot-type smoke detectors shall be permitted on ceilings, sidewalls, or the bottom of beams or solid joists

For rooms of 900 ft2 (84 m2) or less, the following shall apply:

Use of smooth ceiling spacing shall be permitted.

Location of spot-type smoke detectors shall be permitted on ceilings or on the bottom of beams

[72:17.7.3.2.4.2]

13.7.4.3.3.4.3\*

For sloping ceilings with beams running parallel up slope, the following shall apply:

Spot-type detector(s) shall be located on the ceiling within beam pocket(s).

The ceiling height shall be taken as the average height over slope.

Spacing shall be measured along a horizontal projection of the ceiling.

Smooth ceiling spacing shall be permitted within beam pocket(s) parallel to the beams.

For beam depths less than or equal to 10 percent of the ceiling height (0.1 H), spot-type detectors shall be located with smooth ceiling spacing perpendicular to the beams.

For beam depths greater than 10 percent of the ceiling height (0.1 H), the following shall apply for spacing perpendicular to the beams:

For beam spacing greater than or equal to 40 percent of the ceiling height (0.4 H), spot-type detectors shall be located in each beam pocket.

For beam spacing less than 40 percent of the ceiling height (0.4 H), spot-type detectors shall not be required in every beam pocket but shall be spaced not greater than 50 percent of smooth ceiling spacing.

[72:17.7.3.2.4.3]

13.7.4.3.3.4.4\*

For sloping ceilings with beams running perpendicular across slope, the following shall apply:

Spot-type detector(s) shall be located at the bottom of the beams.

The ceiling height shall be taken as the average height over slope.

Spacing shall be measured along a horizontal projection of the ceiling.

Smooth ceiling spacing shall be permitted within beam pocket(s).

For beam depths less than or equal to 10 percent of the ceiling height (0.1 H), spot-type detectors shall be located with smooth ceiling spacing.

For beam depths greater than 10 percent of the ceiling height (0.1 H), spot-type detectors shall not be required to be located closer than (0.4 H) and shall not exceed 50 percent of smooth ceiling spacing.

[72:17.7.3.2.4.4]

13.7.4.3.3.4.5\*

For sloped ceilings with beam pockets formed by intersecting beams, the following shall apply:

Spot-type detector(s) shall be located at the bottom of the beams.

The ceiling height shall be taken as the average height over slope.

Spacing shall be measured along a horizontal projection of the ceiling.

For beam depths less than or equal to 10 percent of the ceiling height (0.1 H), spot-type detectors shall be spaced with not more than three beams between detectors and shall not exceed smooth ceiling spacing.

For beam depths greater than 10 percent of the ceiling height (0.1 H), spot-type detectors shall be spaced with not more than two beams between detectors, but shall not be required to be spaced closer than (0.4 H), and shall not exceed 50 percent of smooth ceiling spacing.

[72:17.7.3.2.4.5]

13.7.4.3.3.4.6

For sloped ceilings with solid joists, the detectors shall be located on the bottom of the joist. [72:17.7.3.2.4.6]

13.7.4.3.4 Air Sampling-Type Smoke Detector

13.7.4.3.4.1 General

13.7.4.3.4.1.1

In the absence of specific performance-based design criteria, each sampling port of an air sampling—type smoke detector shall be treated as a spot-type detector for the purpose of location and spacing in accordance with 17.7.3 of NFPA 72. [72:17.7.3.6.1.1]

13.7.4.3.4.1.2

Air sampling—type smoke detectors shall produce trouble signals if the airflow is outside the manufacturer's specified range. [72:17.7.3.6.1.2]

13.7.4.3.4.1.3

If provided, atmospheric contaminant filtration shall be listed for use with the detector and installed and maintained in accordance with the air sampling—type smoke detector manufacturer's published instructions. [72:17.7.3.6.1.3]

13.7.4.3.4.2 Pipe Network

13.7.4.3.4.2.1

Maximum air sample transport time from the farthest sampling port to the detector shall not exceed 120 seconds. [72:17.7.3.6.2.1]

13.7.4.3.4.2.2

Sampling pipe networks shall be designed on the basis of, and shall be supported by, computer-based fluid dynamics design calculations to ensure required performance. [72:17.7.3.6.2.2]

13.7.4.3.4.2.3

The sampling pipe network design calculations shall include pressure, volumetric flow, and alarm sensitivity at each sampling port. [72:17.7.3.6.2.3]

13.7.4.3.4.2.4

Software applications for the design of pipe networks shall be listed for use with the manufacturer's equipment. [72:17.7.3.6.2.4]

13.7.4.3.4.2.5

Sampling system piping shall be conspicuously identified as "SMOKE DETECTOR SAMPLING TUBE — DO NOT DISTURB," as follows:

At changes in direction or branches of piping

At each side of penetrations of walls, floors, or other barriers

At intervals on piping that provide visibility within the space, but no greater than 20 ft (6.1 m)

[72:17.7.3.6.2.5]

13.7.4.3.4.2.6\*

Sampling ports shall be identified as such. [72:17.7.3.6.2.6]

13.7.4.3.4.2.7\*

If provided, test ports at the end (most remote location) of a pipe run installed in the pipe network solely for the purpose of validating consistency in performance (also referred to as benchmark test points) shall be included in the design calculations and allowed, but not required, to comply with the requirements of 13.7.4.3.4.2. [72:17.7.3.6.2.7]

13.7.4.3.4.2.8

If the piping and fittings are painted, the painting shall be performed in accordance with the air sampling—type smoke detector manufacturer's published instructions. [72:17.7.3.6.2.8]

13.7.4.3.4.2.9\*

Pipe network materials, sizing, and installation shall be in accordance with the manufacturer's published requirements and suitable for use in the environment in which they are installed. [72:17.7.3.6.2.9]

13.7.4.3.4.2.10

Where used, capillary tubing shall be sized and affixed in accordance with the manufacturer's published instructions and computer-based design calculations. [72:17.7.3.6.2.10]

13.7.4.3.5\* Projected Beam-Type Smoke Detectors

13.7.4.3.5.1

Projected beam-type smoke detectors shall be located in accordance with the manufacturer's published instructions. [72:17.7.3.7.1]

13.7.4.3.5.2

The effects of stratification shall be evaluated when locating the detectors. [72:17.7.3.7.2]

13.7.4.3.5.3

The beam length shall not exceed the maximum permitted by the equipment listing. [72:17.7.3.7.3]

13.7.4.3.5.4

If mirrors are used with projected beams, the mirrors shall be installed in accordance with the manufacturer's published instructions. [72:17.7.3.7.4]

13.7.4.3.5.5

A projected beam—type smoke detector shall be considered equivalent to a row of spot-type smoke detectors for level and sloping ceiling applications. [72:17.7.3.7.5]

13.7.4.3.5.6

Projected beam—type detectors and mirrors shall be mounted on stable surfaces to prevent false or erratic operation due to movement. [72:17.7.3.7.6]

13.7.4.3.5.7

The beam shall be designed so that small angular movements of the light source or receiver do not prevent operation due to smoke and do not cause nuisance or unintentional alarms. [72:17.7.3.7.7]

13.7.4.3.5.8\*

The light path of projected beam—type detectors shall be kept clear of opaque obstacles at all times. [72:17.7.3.7.8]

13.7.4.3.6\* Protection During Construction

13.7.4.3.6.1

Where detectors are installed for signal initiation during construction, they shall be cleaned and verified to be operating in accordance with the listed sensitivity, or they shall be replaced prior to the final acceptance test of the system. [72:17.7.1.12.1]

13.7.4.3.6.2

Where detectors are installed but not operational during construction, they shall be protected from construction debris, dust, dirt, and damage in accordance with the manufacturer's recommendations and verified to be operating in accordance with the listed sensitivity, or they shall be replaced prior to the final acceptance test of the system. [72:17.7.1.12.2]

13.7.4.3.6.3

Where detection is not required during construction, detectors shall not be installed until after all other construction trades have completed cleanup. [72:17.7.1.12.3]

13.7.4.3.7 Ceiling Tiles and Ceiling Assemblies

Where automatic detectors are installed, ceilings necessary for the proper actuation of the fire protection device in accordance with NFPA 72 shall be maintained.

13.7.4.3.8 High Air Movement Areas

13.7.4.3.8.1 Location

Smoke detectors shall not be located directly in the airstream of supply registers. [72:17.7.6.3.2]

13.7.4.3.8.2\* Spacing

13.7.4.3.8.2.1

Smoke detector spacing shall be reduced where the airflow in a defined space exceeds 8 minutes per air change (total space volume) (equal to 7.5 air changes per hour). [72:17.7.6.3.3.1]

13.7.4.3.8.2.2

Where spacing must be adjusted for airflow, spot-type smoke detector spacing shall be adjusted in accordance with Table 13.7.4.3.8.2.2 or Figure 13.7.4.3.8.2.2 before making any other spacing adjustments required by this Code. [72:17.7.6.3.3.2]

FIGURE 13.7.4.3.8.2.2 High Air Movement Areas (Not to Be Used for Under-Floor or Above-Ceiling Spaces). [72:Figure 17.7.6.3.3.2]

Table 13.7.4.3.8.2.2 Smoke Detector Spacing Based on Air Movement (Not to Be Used for Under-Floor or Above-Ceiling Spaces)

Minutes per

Air Change

Air Changes

per Hour

Spacing per Detector

ft2

m2

1

60

125

12

2

30

250

23

3

20

375

35

4

15

500

46

5

12

625

58

6

10

750

70

7

8.6

875

81

8

7.5

900

84

9

6.7

900

84

10

6

900

84

[72:Table 17.7.6.3.3.2]

13.7.4.3.8.2.3

Air-sampling or projected beam smoke detectors shall be installed in accordance with the manufacturer's published instructions. [72:17.7.6.3.3.3]

13.7.4.4 Inspection, Testing, and Maintenance

The inspection, testing, and maintenance for fire alarm and fire detection systems shall be in accordance with NFPA 72.

13.7.4.5\*

In other than one- and two-family dwellings, sensitivity of smoke detectors shall be tested in accordance with 13.7.4.5.1 through 13.7.4.5.6. [72:14.4.4.3]

13.7.4.5.1

Sensitivity shall be checked within 1 year after installation. [72:14.4.4.3.1]

13.7.4.5.2

Sensitivity shall be checked every alternate year thereafter unless otherwise permitted by compliance with 13.7.4.5.3. [72:14.4.4.3.2]

13.7.4.5.3

After the second required calibration test, if sensitivity tests indicate that the device has remained within its listed and marked sensitivity range (or 4 percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of 5 years. [72:14.4.4.3.3]

13.7.4.5.3.1

If the frequency is extended, records of nuisance alarms and subsequent trends of these alarms shall be maintained. [72:14.4.4.3.3.1]

13.7.4.5.3.2

In zones or in areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed. [72:14.4.4.3.3.2]

13.7.4.5.4

Unless otherwise permitted by 13.7.4.5.5, smoke detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or be replaced. [72:14.4.4.3.4]

13.7.4.5.5

Smoke detectors listed as field adjustable shall be permitted to either be adjusted within the listed and marked sensitivity range, cleaned, and recalibrated, or be replaced. [72:14.4.4.3.5]

13.7.4.5.6

The detector sensitivity shall not be tested or measured using any device that administers an unmeasured concentration of smoke or other aerosol into the detector or smoke alarm. [72:14.4.4.3.6]

13.8 Other Fire Protection Systems

13.8.1

Where other fire protection systems are required to be installed by the provisions of this Code, or are installed with the approval of the AHJ as an alternative or equivalency, the design and installation of the system shall comply with the appropriate standards listed in Table 13.8.1.

Table 13.8.1 Other Required Fire Protection Systems

Type of System

NFPA Standard

Low-, medium-, and high-expansion

foam systems

NFPA 11

Carbon dioxide systems

NFPA 12

Halon 1301 systems

NFPA12A

Sprinklers in one- and two-family

dwellings and manufactured homes

NFPA 13D

Sprinklers in residential occupancies up

to and including four stories in height

NFPA 13R

Water spray systems

NFPA 15

Deluge foam-water sprinkler, foam-water

spray systems, and closed-head foam-water sprinkler systems

NFPA 16

Dry chemical extinguishing systems

NFPA 17

Wet chemical extinguishing systems

NFPA17A

Water mist systems

NFPA 750

Clean agent fire-extinguishing systems

NFPA 2001

Aerosol extinguishing systems

NFPA 2010

13.8.2

Other fire protection systems permitted by 13.8.1 shall be tested and maintained in accordance with 4.5.8.

13.9 Non-Listed Fire Protection or Suppression Devices and Equipment

13.9.1

It shall be unlawful to market, sell, advertise, or distribute any device or equipment as suitable for fire protection or fire suppression purposes unless the device or equipment is listed for such purpose by a nationally recognized testing laboratory or as otherwise permitted by 13.9.2.

13.9.2

The requirements of 13.9.1 shall not apply where NFPA standards, other adopted standards, or the adopted code allow the use of non-listed fire protection or suppression equipment.





