



# CODE UPDATES FOR FIRE PROTECTION



build safe | live safe

*presented by*

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# PRESENTATION DESCRIPTION

In this presentation, in an effort to protect the health, safety and welfare of the building occupants and the surrounding neighborhood, participants will learn about significant changes in the 2022 Building Code Chapter 9 (Fire Protection Systems) including associated Appendix Q.



# AGENDA

## ■ Fire Protection

- **BC 903** Automatic Sprinkler Systems
- **BC 904** Alternative Automatic Fire-Extinguishing Systems
- **BC 905** Standpipe Systems
- **BC 907** Fire Alarm and Detection Systems
- **BC 909** Smoke Control Systems
- **BC 910** Smoke and Heat Removal
- **BC 911** thru **BC 918** (911) Fire Command Center, (913) Fire Pumps, (916) ARCS, (917) Post Fire Smoke Purge Systems, (918) Gas Detection Systems

## ■ Appendix Q



**BC 903**

***Automatic Sprinkler Systems***

# BC 903.1.2: CONSTRUCTION DOCUMENTS

Construction documents for automatic sprinkler systems shall contain plans that include the following data and information:

- The location and size of water supplies and the location, [spacing,] number, and type of sprinkler heads to be used, with approximate location and size of all feed mains, valves and other essential features of the system. For hydraulically calculated systems, hydraulic data substantiating pipe sizes shown shall be submitted and hydraulic reference points and areas must be indicated on the plan. If any other methods are utilized to size the sprinkler system and its components, as allowed by NFPA 13, supporting documentation shall be submitted to the department.

## *Analysis:*

*This new text clarifies that documentation is required for sprinkler system design.*

# BC 903.2: CONSTRUCTION DOCUMENTS

- 903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in [this section] Sections 903.2.1 through 903.2.13.

Exceptions:

...

3. Sprinklers shall not be required in rooms and spaces protected by an alternative fire suppression system in accordance with the New York City Fire Code and Section 904 of this code.

## *Analysis:*

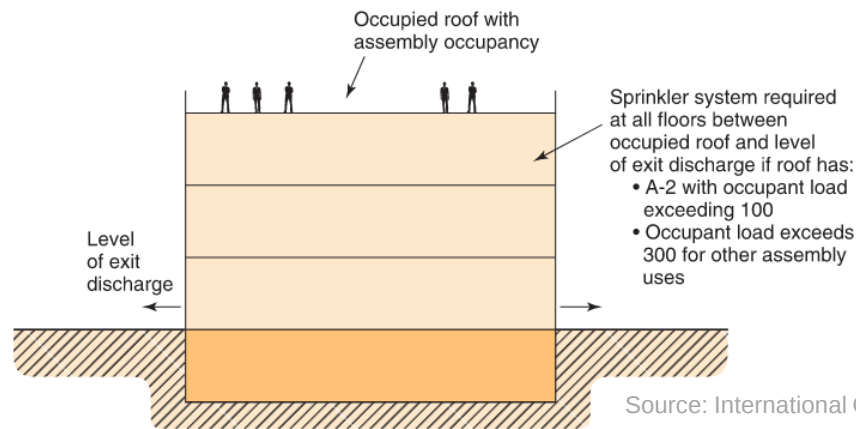
*This new text clarifies that sprinklers are not required where alternative fire protection is provided.*



# BC 903.2.1.6: ASSEMBLY OCCUPANCIES ON ROOFS



Source: [metmuseum](https://www.metmuseum.org)



Source: International Code Council

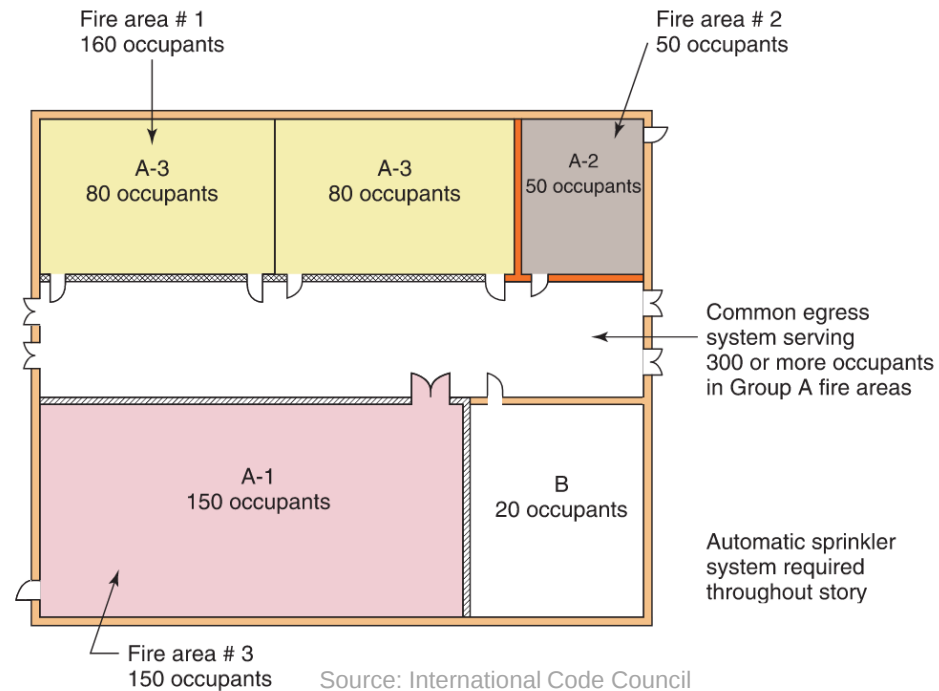
- Where an occupied roof has an assembly occupancy with an occupant load exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the occupied roof and the level of exit discharge shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or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

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

## ***Analysis:***

*This new requirement, based on IBC, adds continuous sprinkler protection along the exit path from all Assembly Occupancy Roofs to the Level of Exit Discharge.*

# BC 903.2.1.7: MULTIPLE FIRE AREAS



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

## Analysis:

This new section requires additional sprinkler protection along the shared common egress paths of multiple fire areas in certain assembly occupancies.

# BC 903.2.2.1: AMBULATORY HEALTH CARE FACILITIES



Ambulatory Health care facility Source: [nyulangone](https://www.nyulangone.org)

- An automatic sprinkler system shall be installed throughout all fire areas containing a Group B ambulatory health care facility occupancy. In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor where such care is provided as well as all floors below, and all floors between the level of ambulatory care and the nearest level of exit discharge, including the level of exit discharge.

## ***Analysis:***

- *This new text, based on IBC, requires sprinklers to be throughout an entire floor if an Occupancy Group B Ambulatory Care Facility is located on any part of such floor*
- *In addition, continuous sprinkler coverage is now required between the ambulatory care facility and the level of exit discharge.*



# BC 903.2.3: GROUP E



Group E Occupancy Source: [Angel Franco for The New York Times](#)

- An automatic sprinkler system shall be provided for Group E occupancies as follows:
  1. Throughout all Group E fire areas greater than **12,000** square feet (1114.8 m<sup>2</sup>) in area.

## **Analysis:**

*As required for increased safety, this section has been modified to lower the square footage threshold trigger for sprinklers in in Group E occupancies.*

# BC 903.2.4: GROUP F



Manufacture of highly flammable product Source: [Andrea Morales for TWSJ](#)

## ***Analysis:***

*This new requirement was added to increase safety in occupancy Group F (factory) facilities with upholstered furniture or mattresses, which are or a potentially highly flammable products.*

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

...

5. Where a Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232.3 m<sup>2</sup> ).



# BC 903.2.6: GROUP I



Source: [procaresoftware.com](http://procaresoftware.com)

## **Analysis:**

*Two additional exceptions, regarding sprinkler coverage of I-4 day care facilities, were added*

- An automatic sprinkler system shall be provided in Group I occupancies. An automatic sprinkler system shall be installed throughout buildings with a main use or dominant occupancy of Group I.

## Exceptions:

- An automatic sprinkler system installed in accordance with Section 903.3.1.2 or 903.3.1.3 shall be allowed in Group I-1 facilities if located in an I-1 occupancy building or a residential building, provided such building is six stories or less in height.
- An automatic sprinkler system is not required where Group I-4 day care facilities are at the level of exit discharge and where every room where care is provided has not fewer than one exterior exit door.
- In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the level of exit discharge, and all floors below the level of exit discharge other than areas classified as an open parking garage.

# BC 903.2.7: GROUP M



Display and sale of highly flammable product Source: [Mattress store](#)

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

...

4. A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464.5 m<sup>2</sup>).

## ***Analysis:***

*This new requirement was added to increase safety in Occupancy Group M (retail) facilities with upholstered furniture or mattresses, which are or a potentially highly flammable products.*

# BC 903.2.9: GROUP S-1



Source: [fleetmaintenance.com](http://fleetmaintenance.com)

## **Analysis:**

*Item 5 is new requirement that was added to increase safety in Occupancy Group S-1 (storage) facilities with stored commercial vehicles, which are potentially highly flammable.*

*Item 6 is a new requirement that was added to increase safety in Occupancy Group S-1 (storage) facilities with upholstered furniture or mattresses, which are potentially highly flammable products.*

- An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where any one of the following conditions exists:
  - ...
  - 5. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464.5 m<sup>2</sup>).
  - 6. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232.3 m<sup>2</sup>).



# BC 903.2.9.3, 903.2.10.4: HIGH PILED STORAGE



High-piled storage Source: [firesmarts](#)

## Analysis:

- New section that explicitly calls out FDNY Fire Code requirements for automatic sprinkler system requirements in facilities with high-piled storage.
  - Expands on previous NFPA 13 sprinkler system requirements regarding high piled storage

- **BC 903.2.9.3 High-piled storage.** An automatic sprinkler system shall be provided in accordance with the New York City Fire Code in all buildings or portions thereof in **Group S-1** occupancies where the storage of merchandise is in high-piled or rack storage arrays.
- **BC 903.2.10.4 High-piled storage.** An automatic sprinkler system shall be provided in all buildings or portions thereof of **Group S-2** occupancies in accordance with the New York City Fire Code.

# BC 903.2.13: TYPE IV CONSTRUCTION WITH CLT AND SCL



Cross laminated timber (CLT)

- Automatic sprinkler systems in accordance with NFPA 13 shall be required throughout buildings utilizing Type IV construction with CLT or SCL as follows:
  - In all occupancies where the building is more than three stories above grade plane.
  - In Group B occupancies, where a floor exceeds 28,500 square feet (2647.7 m<sup>2</sup>).

## *Analysis:*

*SCL and CLT materials are now allowed. As a result, this section was added to address such materials and mandate that a sprinkler system be provided in accordance with NFPA 13*



# BC 903.3.1.1.1: EXEMPT LOCATIONS PROTECTED BY OTHER MEANS



Automatic sprinkler system Source: flickr



- When approved by the Fire Department, automatic sprinklers shall not be required in the following:

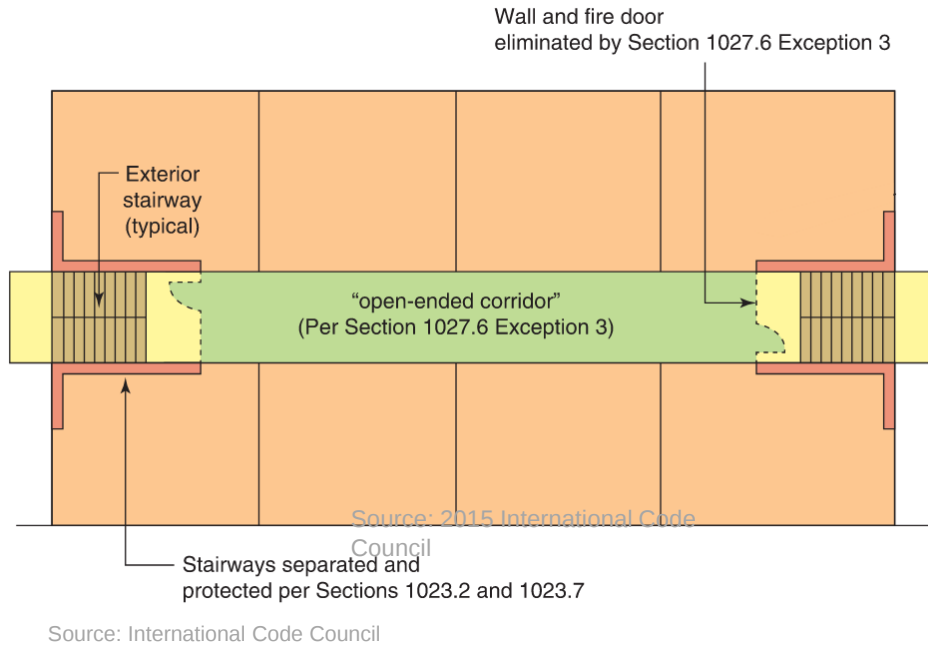
...

2. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008.

## *Analysis:*

*This section added that, subject to FDNY approval, automatic sprinklers shall not be required in machine rooms, machinery spaces, control rooms and control spaces, when such rooms/spaces are associated with occupant evacuation elevators*

# BC 903.3.1.2.2: OPEN-ENDED CORRIDORS



- [When applying NFPA 13R,] sprinkler protection and freeze protection shall be provided in open-ended corridors and associated exterior stairways and ramps as specified in Section 1027.6, Exception 3.

## Analysis:

*This section coordinates with 2022 BC 1027.6, Exception 3 and adds sprinkler and freeze protection requirements for open-ended corridors, i.e. corridors exposed to outside environment.*

# BC 903.3.2: QUICK-RESPONSE AND RESIDENTIAL SPRINKLERS



Source: [Specadsystems.com](http://Specadsystems.com)

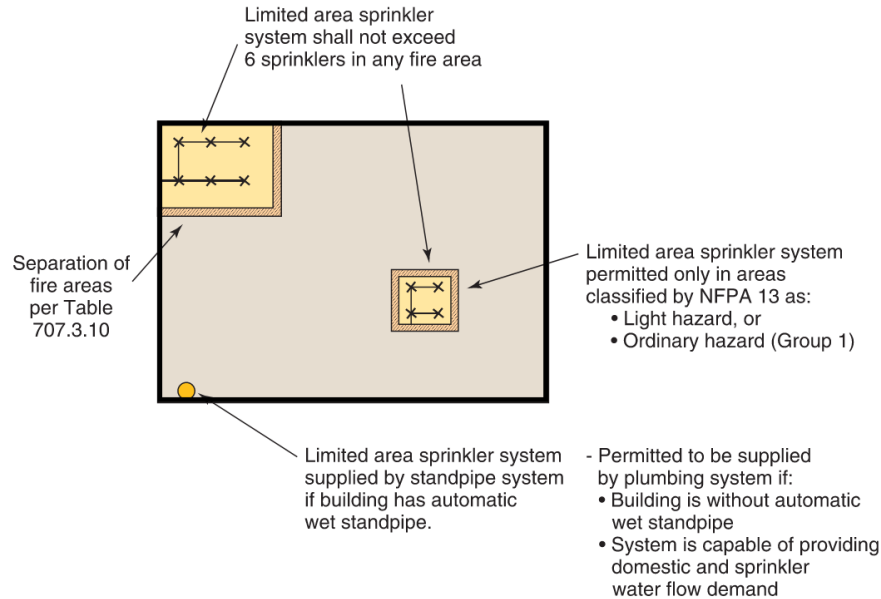
## Analysis:

*This section adds new requirement for quick response and residential type sprinklers in:*

- *Treatment rooms in ambulatory care facilities*
- *Sleeping Units in Group I-2 and R occupancies.*

- Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in all of the following areas in accordance with Section 903.3.1 and their listings:
  - Throughout all spaces within a smoke compartment containing **care recipient sleeping units** in Group I-2 in accordance with this code.
  - **Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.**
  - Dwelling units and sleeping units in Group I-1 **and R** occupancies.
  - Light-hazard occupancies as defined in NFPA.

# BC 903.3.8: LIMITED AREA SPRINKLER SYSTEMS



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

- **903.3.8.1 Number of sprinklers.** Limited area sprinkler systems shall not exceed six sprinklers in any single fire area.
- **903.3.8.2 Occupancy Hazard Classification.** Only areas classified by NFPA 13 as Light Hazard or Ordinary Hazard Group 1 shall be permitted to be protected by limited area sprinkler systems.

## Analysis:

- This section reduces the number of sprinklers for “limited area sprinkler systems,” i.e. those sprinkler systems tapped off of domestic water line.
- Reduction of sprinkler count from 20 to 6 aligns with IBC; R-3 construction will utilize NFPA 13D sprinkler requirements.



# BC 904

## *Alternative Automatic Fire-Extinguishing Systems*



# BC 904.3.2: ACTUATION [ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYS.]



Source: [Kidde-fenwal.com](http://Kidde-fenwal.com)

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

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

## Analysis:

- Multiple fire hazards must be protected by a common fire protection system
- New Alternative added to allow multiple systems to operate simultaneously.

# BC 904.11: AUTOMATIC WATER MIST SYSTEMS



Source: [AITO Firework](#)

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

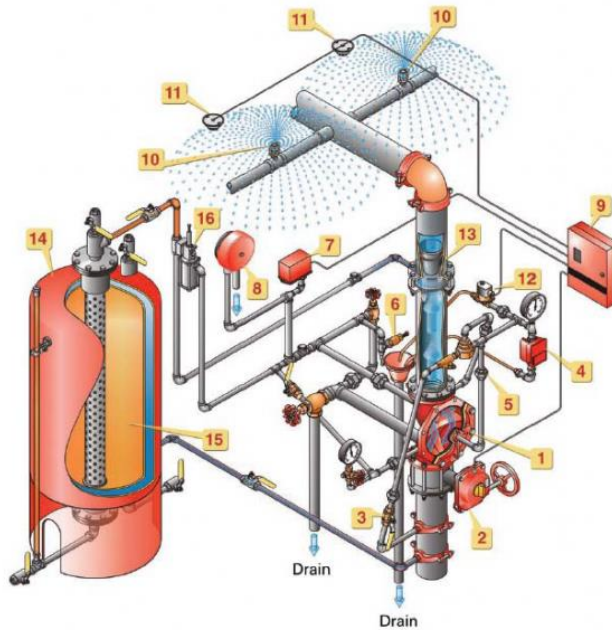
## ***Analysis:***

*This section was modified by adding additional subsections to explain the following requirements:*

- Automatic activation;
- System Monitoring, associated alarms, controls and control valves;
- Water supply; and
- Testing, maintenance , and operation in accordance with NYC FC

*Based on IBC Sections 904.11 through 904.11.3 relating to automatic water mist systems*

# BC 904.12: COMMERCIAL COOKING SYSTEMS



## LEGEND

1 Deluge Valve (DV-5)	7 Pressure Switch	13 Foam Proportioner
2 Isolation Valve	8 Water Motor Gong	14 Foam Bladder Tank
3 Diaphragm Supply Valve	9 Releasing Panel	15 Foam Concentrate
4 Manual Control Station	10 Spray Nozzle	16 Hydraulic Ball Valve
5 Automatic Shut-off Valve	11 Smoke/Heat Detector	
6 Automatic Drain Valve	12 Solenoid Valve	

Source: [enggcyclopedia.com](http://enggcyclopedia.com)

- **Only automatic** fire-extinguishing systems of the following types shall be installed in accordance with the New York City Fire Code:
  - Foam water sprinkler system or foam water spray systems.
  - Wet-chemical extinguishing systems

**Automatic sprinkler systems, dry-chemical fire-extinguishing systems, and carbon dioxide fire-extinguishing systems shall not be installed to protect commercial cooking equipment and exhaust systems.**

## Analysis:

*This section was modified to align with Fire Code*

*Eliminates use of CO2 systems in commercial cooking areas.*

*Clarifies which fire protection systems are not permissible to protect commercial kitchen range hoods.*



**BC 905**

***Standpipe Systems***



# BC 905.3.8: ROOFTOP GARDENS, LANDSCAPED ROOFS AND GREEN ROOFS



Source: [nycgovparks](https://nycgovparks.org)

## ***Analysis:***

*New Section added to ensure protection of all roofs that have an additional purpose beyond weather protection and maintenance, e.g. rooftop gardens and green roofs*

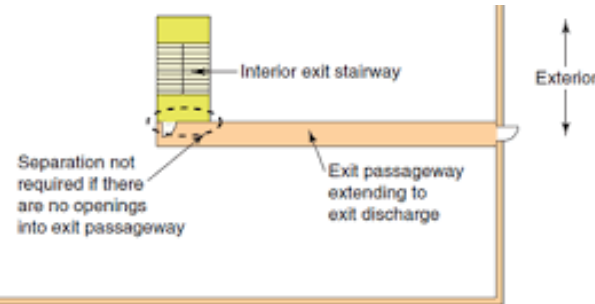
- Buildings with a rooftop garden, landscaped roof, green roof, or roof used for any purpose other than weather protection or maintenance that are equipped with a standpipe system shall extend the standpipe system to the roof level on which the rooftop garden, landscaped roof, green roof, or roof used for any purpose other than weather protection or maintenance is located.



# BC 905.3.9: HIGH-PILED STOCK OR RACK STORAGE



High-piled storage Source: [Colorado Springs Fire Dept](#)



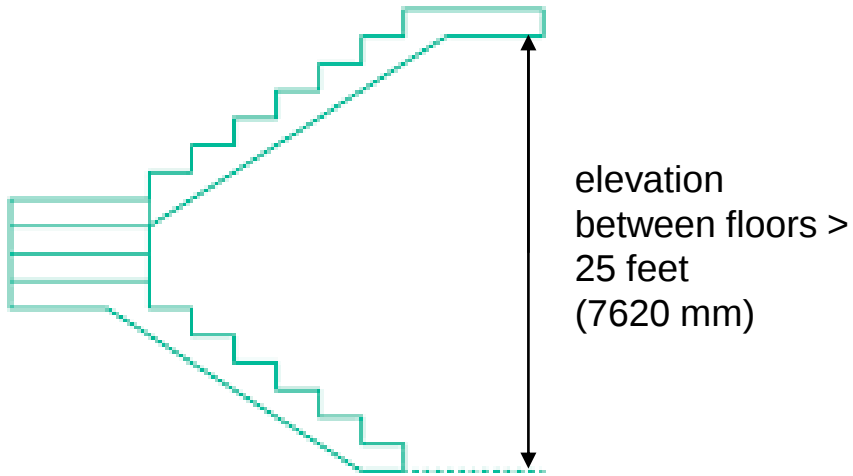
Exit Passageway Source: [ICC Exit Systems](#)

- Where exit passageways are required in accordance with Chapter 10 of this code, a standpipe system shall be provided in accordance with the New York City Fire Code in all buildings containing high-piled stock or rack storage.

## ***Analysis:***

*This added code section explicitly describes standpipe requirements for high-piled storage where exit passageways are present, and refers to additional Fire Code requirements*

# BC 905.4: LOCATION OF CLASS I STANDPIPE HOSE CONNECTIONS



Source: [dimensions.com](https://www.dimensions.com)

- Class I standpipe hose connections shall be provided in all of the following locations:

...

7. In any staircase where the change in elevation between floor landings is more than 25 feet (7620 mm), in addition to the hose connections required by Item 1, a hose connection shall be installed at the first intermediate stair landing below the higher floor level.

## *Analysis:*

*New Requirement - Item #7 added to increase quantity of locations of Class I standpipe hose connections, thereby increasing building safety.*

# BC 905.6: LOCATION OF CLASS III STANDPIPE HOSE CONNECTIONS



Source: [dimensions.com](https://www.dimensions.com)

- Class III standpipe systems shall have 2½-inch (63.5 mm) hose connections located as required for Class I standpipes in Section 905.4. At each hose connection, there shall be a hose station. The hose stations shall be equipped with a minimum of 125 feet (38 100 mm) but not more than a maximum of 150 feet (45 720 mm) of 1½-inch (38.1 mm) fire hose connected to an adjustable fog nozzle. The hose shall be attached to the 2½-inch (63.5 mm) hose connection by a 2½-inch (63.5 mm) by 1½-inch (38.1 mm) non-swivel reducing coupling. The hose shall be mounted on a rack and may be located in a cabinet, in accordance with Section 905.7. A pressure restricting device shall be installed when required by NFPA 14. Such pressure restricting device and reducing coupling shall be installed in such a manner that they are readily removable by the Fire Department

## ***Analysis:***

- *This section was modified to provide a more detailed description of Class III standpipe hose connections.*
- *Pressure Restricting Devices must all be readily removable by FDNY*

# BC 905.7.1: CABINET EQUIPMENT IDENTIFICATION



Source: [potterroemer.com](http://potterroemer.com)

- Cabinets shall be identified in an approved manner by a permanently attached sign with white letters not less than 2 inches (50.8 mm) high and a red background color, indicating the equipment contained therein.

Exceptions:

1. Doors not large enough to accommodate a written sign with 2-inch lettering shall be marked with a permanently attached pictogram indicating the equipment contained therein, in addition to corresponding smaller white lettering on a red background adjacent to such pictogram.

## *Analysis:*

*New Requirement provides identification requirements for small fire protection equipment cabinets and associated doors*





# BC 907

## *Fire Alarm and Detection Systems*

# BC 907.2.3: GROUP E



- A manual and automatic fire alarm system shall be installed in Group E occupancies. An emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies.

Exception: Emergency voice/alarm communication systems meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall not be required in Group E occupancies with occupant loads of 100 or less, provided that activation of the manual and automatic fire alarm system initiates an approved occupant notification signal in accordance with Section 907.5.

## *Analysis:*

*One-way voice communication is now required for all Group E (Education) occupancies with cumulative occupant loads greater than 100 persons.*

# BC 907.2.9: GROUP R-2



Source: [tecservuk](https://www.tecservuk.com)

- **Group R-2.** A fire alarm system without alarm notification appliances and smoke alarms shall be installed in accordance with this section in Group R-2 occupancies, other than student apartments, where such occupancy satisfies any one of the following conditions:
  - Any dwelling unit is located three or more stories above the lowest level of exit discharge, including dwelling units in penthouses of any area;
  - Any dwelling unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit; or
  - The building contains more than 16 dwelling units.
- Actuation of smoke detectors shall not initiate a signal to alarm notification appliances. The activation of any detector required by this section shall initiate a signal at a central station or a constantly attended location. Smoke detectors shall be located as follows:
  - In each mechanical equipment, electrical, transformer, telephone equipment or similar room.
  - In air distribution systems in accordance with Section 606 of the New York City Mechanical Code.
  - In elevator machine rooms and in elevator lobbies

## **Analysis:**

Now mandates, regardless of square footage, that smoke detection is provided in mechanical equipment, electrical transformer, telephone equipment or similar rooms. Previous 2014 Code had a square foot minimum requirement, which is elimination

# BC 907.2.10: GROUP S



Source: Cubesmart

- A manual and automatic fire alarm system shall be installed in Group S occupancies where any one of the following conditions exists:
  - Group S fire area has an occupant load of 300 occupants or more;
  - The combined occupant load of all Group S fire areas on all floors, including mezzanines, is 300 or more.
- **907.2.10.1 Large-area buildings.** Group S occupancies having a total gross area exceeding 500,000 square feet (46 451.5 m<sup>2</sup>) located in buildings, where the highest occupied floor is 75 feet (22 860) or less above the lowest level of Fire Department vehicle access, shall be provided with automatic smoke detection connected to an automatic fire alarm system in accordance with Section 907.2.13.1 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2 that initiates a total evacuation signal.

## **Analysis:**

*A fire alarm system is now required in Group S (storage) occupancies if such occupancy fire area has an occupant load of 300 persons or more.*

*Regardless of occupant load, if the Group S occupancy has a total gross area exceeding 500,000 square feet, then a high-rise type of fire alarm system including voice communication is required.*



# BC 907.2.12: SPECIAL AMUSEMENT BUILDINGS



Source: [The Blue Dispatch](#)

## **Analysis:**

*Coordinated with Fire Code Requirements*

*Only persons with FDNY issued Certificates of Fitness are allowed to make “live voice evacuation instructions.” Pre-recorded announcements are not permitted*

- An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.12.1 through 907.2.12.3.

Exception: In areas where ambient conditions will cause a smoke detection system to alarm, an approved alternative type of automatic detector shall be installed.

- 907.2.12.1 Alarm. Actuation of a single smoke detector, automatic sprinkler system or other automatic fire detection system shall initiate a pre-signal system in accordance with NFPA 72 at a constantly attended location from which the Fire Department shall be notified and live voice evacuation instructions shall be initiated using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

# BC 907.3.1: DUCT SMOKE DETECTORS



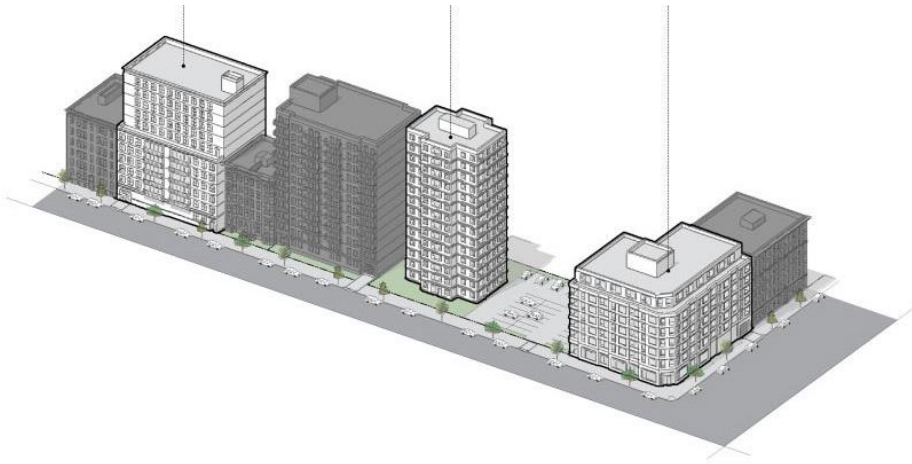
- Smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible alarm signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the New York City Mechanical Code. Duct smoke detectors shall not be used as a substitute for required open area detection.
- **ALARM SIGNAL.** A signal indicating an emergency requiring immediate action, such as a signal indicative of fire
- **SUPERVISORY SIGNAL.** A signal indicating the need for action in connection with the supervision of guard tours, fire suppression systems or equipment, fire alarm systems, or the maintenance features of related systems.

## ***Analysis: (Modified Requirement)***

*New Duct Detectors must now report as an alarm signal at the fire alarm control panel (FACP), which then activates the FDNY approved central station triggering a response from FDNY.*

*In 2014 BC duct detectors had the option of reporting at FACP as either a supervisory or alarm signal. This option is now eliminated.*

# BC 907.5.2.2: EMERGENCY VOICE/ALARM COMMUNICATION



- Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. ...

## Exceptions:

...

- ~~[2. Group R-2 occupancies 125 feet or less in height. Emergency voice/alarm communication systems shall not be required in Group R-2 occupancies in buildings 125 feet (33 100 mm) or less in height.]~~
- [3.] 2. Group R-2 occupancies greater than [125 feet] **75 feet (22 860 mm)** in height. In Group R-2 occupied buildings greater than [125 feet (33 100 mm)] **75 feet (22 860 mm)** in height **above the lowest level of Fire Department vehicle access**, activation of any smoke detector or sprinkler water flow device shall initiate a signal at a central supervising station or constantly attended location and shall not initiate a signal to an alarm notification appliance....

## Analysis: (Modified Requirement)

*This section modifies requirement for an emergency voice/alarm system in Group R-2 buildings greater than 75' in height. This is to coordinate changes to ARCS, which is now modified to be required in buildings greater than 125'.*



# BC 907.5.2.2.4: EMERGENCY VOICE/ALARM COMMUNICATION CAPTIONS



Source: [nypost.com](https://nypost.com)

## ***Analysis: (Modified Requirement)***

*This section modifies requirement of emergency captions for public announcements in stadiums, arenas, etc.*

*Coordinated with BC 1108.2.7.3 (Accessibility)*

- **Emergency voice/alarm communication captions.** Where stadiums, arenas and grandstands provide audible public announcements, the emergency/voice alarm communication system shall be captioned. Emergency captions shall be approved by the Fire Department.

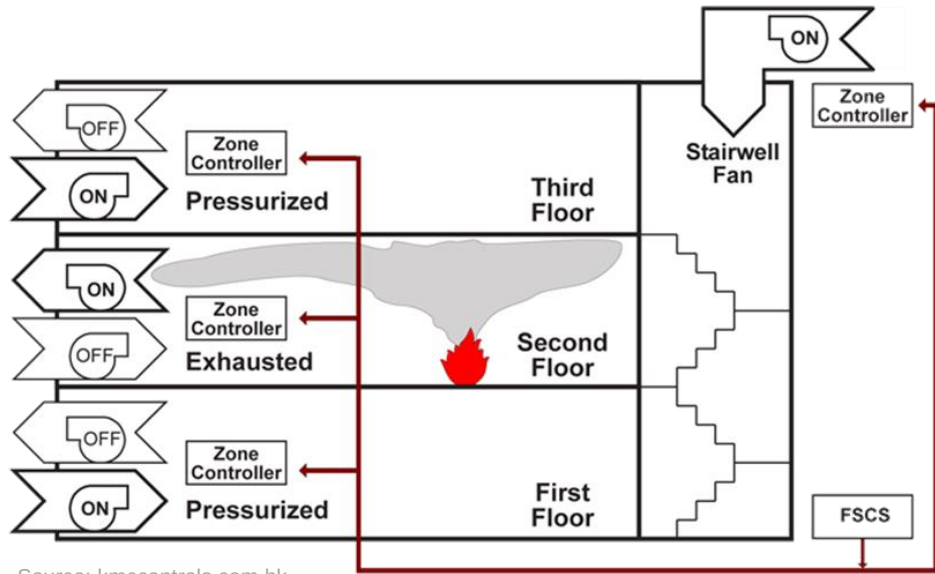




# BC 909

## *Smoke Control Systems*

# BC 909.4.7: SMOKE CONTROL SYSTEM INTERACTION



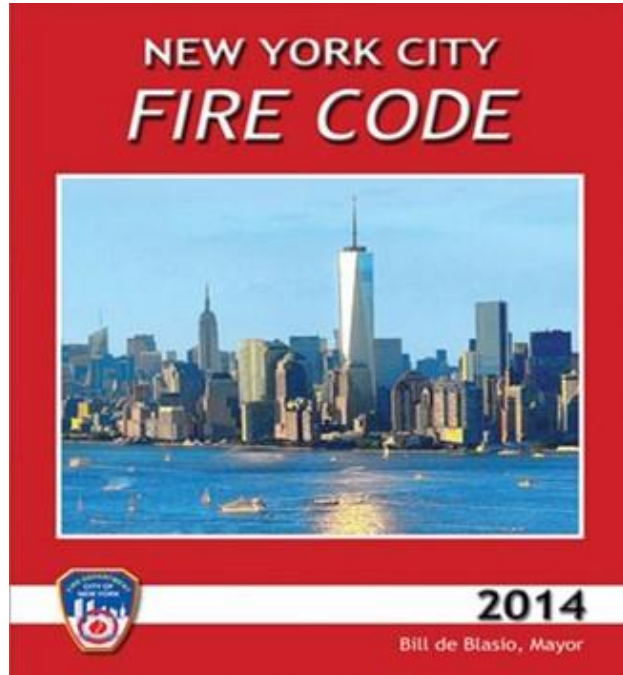
Source: [kmcccontrols.com.hk](http://kmcccontrols.com.hk)

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

## Analysis:

*New section added to advise designers to consider the possibility of different scenarios for activation of multiple smoke control systems, and their impact on efficient and effective smoke removal. For example, the interaction between the smoke control systems relevant to elevator pressurization, stairway pressurization, and an atrium within the building needs to be analyzed.*

# BC 909.6.3: PRESSURIZED STAIRWAYS AND ELEVATOR HOISTWAYS



- Where stairways or elevator hoistways are pressurized, such pressurization systems shall comply with Section 909 of this code as smoke control systems, in addition to the requirements of Sections 909.20 and 909.21 of this code and the New York City Fire Code.

## *Analysis: (New Section)*

*Coordinates with 2022 BC Sections 909.20 (Smokeproof Enclosures), 909.21 (Alternate to Elevator Hoistway Pressurization) and the NYC Fire Code*

# BC 909.11.1: EQUIPMENT ROOM



Source: [dieselforum.org](http://dieselforum.org)

- The standby power source shall be located in a room separate from the normal power transformers and switch gears, and ventilated directly to and from the exterior. The room shall be enclosed with not less than 2-hour fire barriers constructed in accordance with Section 707, or with not less than 2-hour fire-resistance-rated horizontal assemblies constructed in accordance with Section 711, or both.

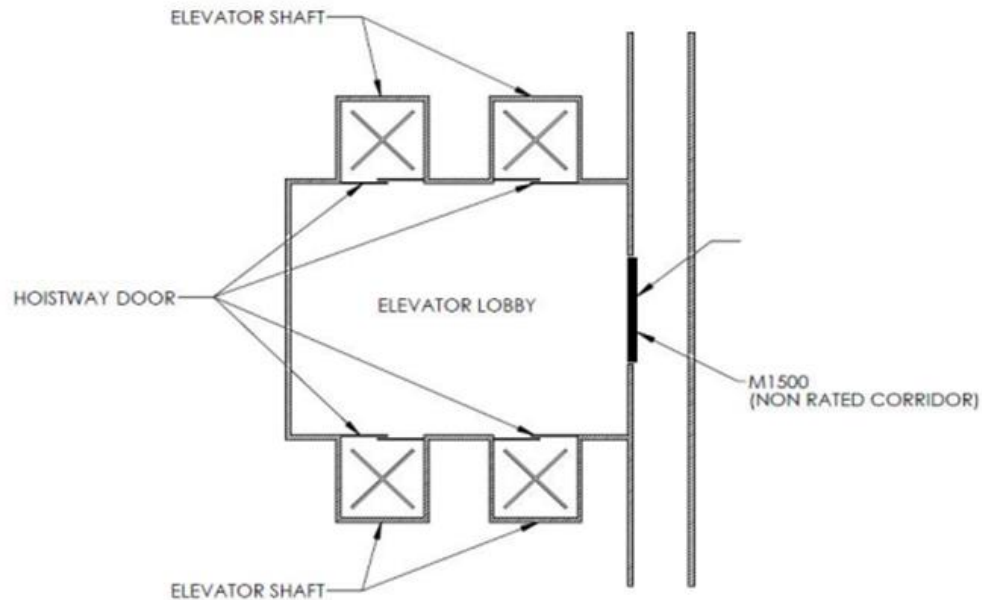
## ***Analysis: (New Section)***

*Consistent with revisions to 2022 MC 513*

*Increases fire resistance rating of separate Standby Generator Room to 2 hours*



# BC 909.21: ELEVATOR HOISTWAY PRESSURIZATION ALTERNATIVE



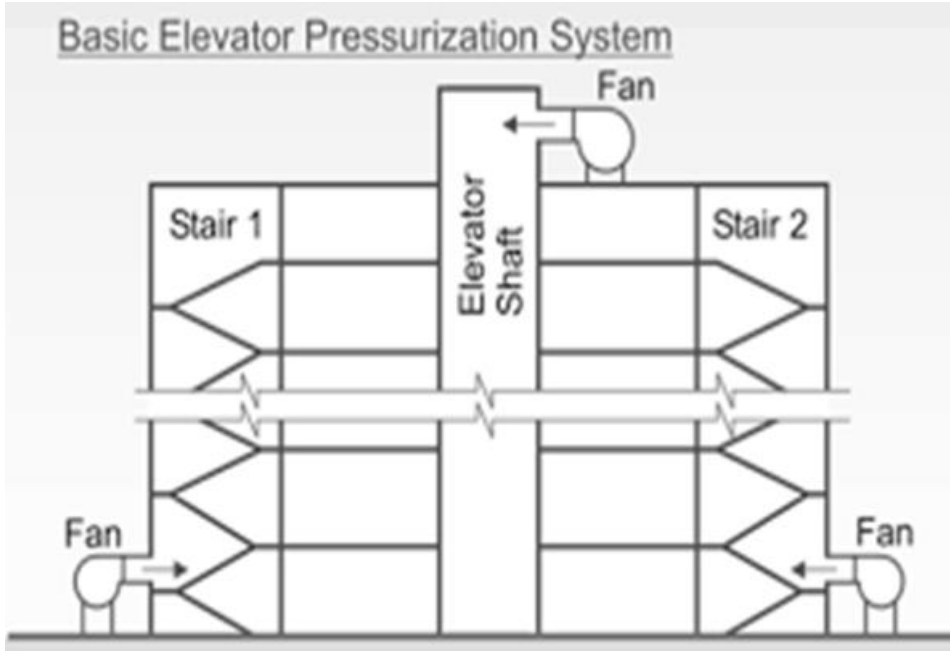
Source: [assets.smokeguard.com](https://assets.smokeguard.com)

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

## ***Analysis: (New Section)***

- Clarifies and Expands Requirements for Hoistway Pressurization, when used as alternative to enclosed (fire rated & smokeproof) elevator lobbies
- Based on IBC

# BC 909.21.6: ACTIVATION OF PRESSURIZATION



Source: [afaa-ne.org](http://afaa-ne.org)

## Analysis:

*Clarifies requirements for activation of pressurization systems serving elevator hoistways.*

*In general, tall buildings require longer evacuation times and deploy many methods for mitigating the transmission of smoke to maintain a tenable environment for evacuation purposes. One method is elevator shaft pressurization, which prevents smoke migration from a fire. Such hoistway's elevator is a possible means of egress for occupants with accessibility needs, who may not be able to safely use the stairwells*



**BC 910**

***Smoke and Heat Removal***

# BC 910.1 AND BC 910.2: GENERAL AND WHERE REQUIRED



Source: [Reliablesprinkler.com](https://reliablesprinkler.com)

- **BC 910.1 General.** Where required by this code, smoke and heat vents or mechanical smoke removal systems shall conform to the requirements of this section.
- **BC 910.2 Where required.** Smoke and heat vents or a mechanical smoke removal system shall be installed as required by Sections 910.2.1 and 910.2.2.

Exception:

- Frozen-food warehouses used solely for storage of Class I and II commodities where protected by an automatic sprinkler system in accordance with Section 903.3.1.1.
- Smoke and heat removal shall not be required in areas of buildings equipped with early suppression fast-response (ESFR) sprinklers.
- Smoke and heat removal shall not be required in areas of buildings equipped with control mode special application sprinklers with a response time index of 50 (m·s)<sup>1/2</sup> or less that are listed to control a fire in stored commodities with 12 or fewer sprinklers.

## **Analysis:**

2022 BC “Mechanical Smoke Removal Systems” replaces previous use of 2104 BC “draft curtains”

New BC 910.2 Exception #3 - recognizes alternative automatic fast response type sprinklers in lieu of smoke and heat vents in certain situations



# BC 909.10.2.1 AND BC 910.2.2: GROUP F-1 OR S-1 AND HIGH-PILES COMBUSTIBLE STORAGE



Source: [blog.koorsen.com](http://blog.koorsen.com)

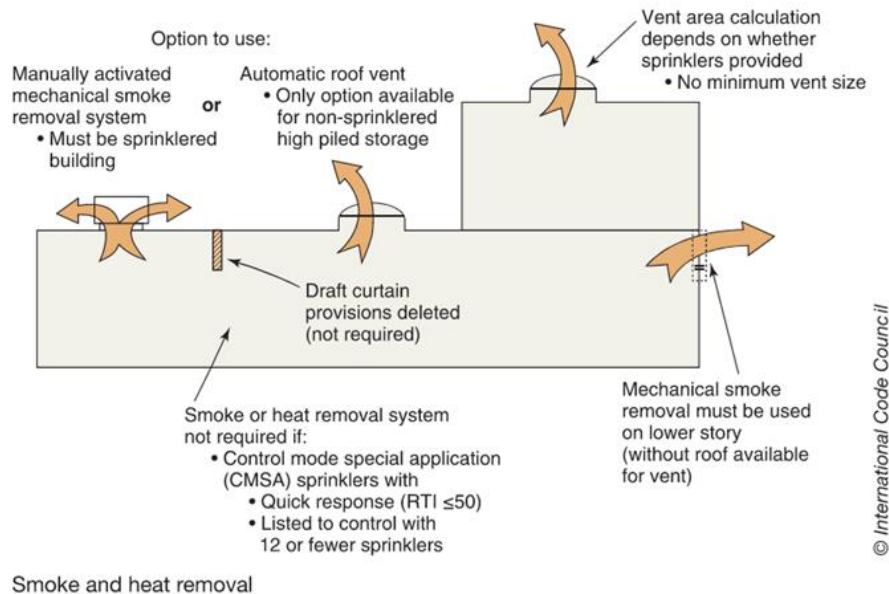
- **BC 909.10.2.1 Group F-1 or S-1.** Smoke and heat vents installed in accordance with Section 910.3 or a mechanical smoke removal system installed in accordance with Section 910.4 shall be installed in buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645.2 m<sup>2</sup>) of undivided area. In occupied portions of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, **where the upper surface of the story is not a roof assembly**, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.
- **BC 910.2.2 High-piled combustible storage.** Smoke and heat removal for buildings and portions thereof containing high-piled combustible storage shall be installed in accordance with the New York City Fire Code and Section 413 of this code. Installation shall also be in conformance with Section 910.3 in unsprinklered buildings and portions thereof.
- In buildings and portions thereof containing high-piled combustible storage equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a smoke and heat removal system shall be installed in accordance with Section 910.3 or 910.4. In occupied portions of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, **where the upper surface of the story is not a roof assembly**, a mechanical smoke removal system in accordance with Section 910.4 shall be installed.

## **Analysis:**

*New requirement for fully sprinklered factory and storage occupancy buildings - Only a smoke removal system is allowed on those stories where the upper surface is NOT a roof assembly*

# BC 910.3: SMOKE AND HEAT VENTS

- The design and installation of smoke and heat vents ~~[and draft curtains]~~ shall be in accordance with Sections 910.3.1 through 910.3.3.

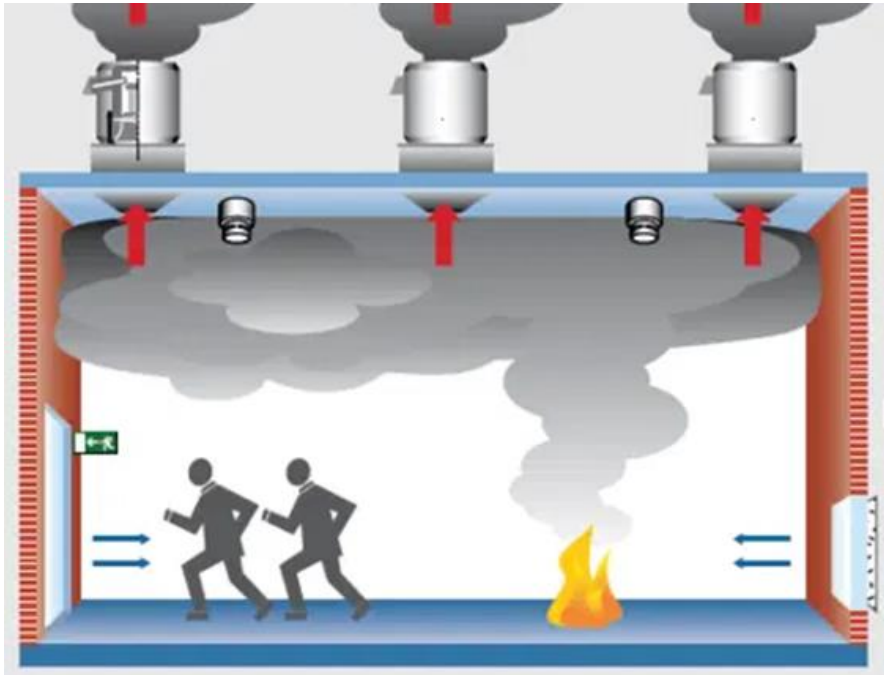


Source: 2015 International Code Council

## Analysis:

- “Draft curtains” were eliminated because of their possible adverse impact on the operation of smoke and heat removal systems.
- 2014 BC Table 910.3 was deleted and replaced with 2022 BC 910.3 subsection text containing equations on smoke & heat vent sizing

# BC 910.4: MECHANICAL SMOKE REMOVAL SYSTEMS



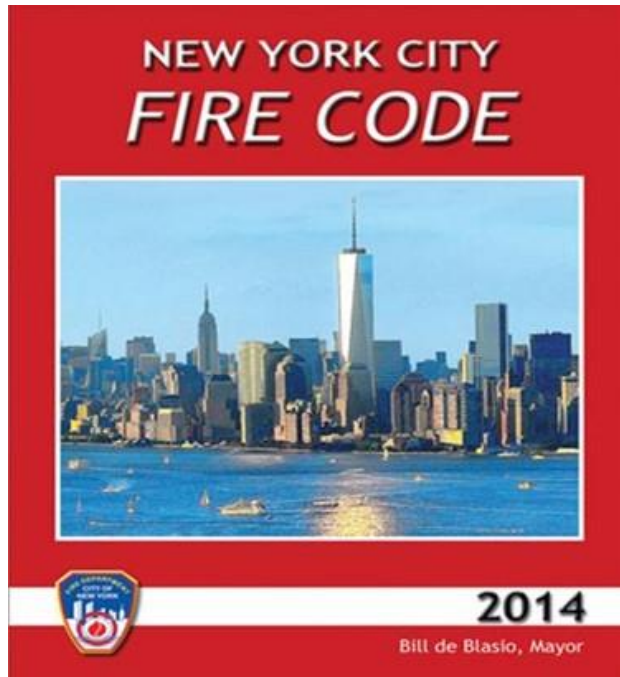
Source: [TROX GmbH](#)

- Mechanical smoke removal systems shall be designed and installed in accordance with Sections 910.4.1 through 910.4.7.

## ***Analysis:***

*Modifies requirements for smoke removal systems, including sprinkler requirements, exhaust fan construction, size and location of make-up air locations, and FDNY approved manual control location*

# BC 910.5: MAINTENANCE



- Smoke and heat vents and mechanical smoke removal systems shall be maintained in accordance with the New York City Fire Code.

## *Analysis:*

*New section clarifies that maintenance coordination with the Fire Code ("FC") is necessary, such as FC sections 909, 107, and 910*



# BC 911 thru BC 918

*(911) Fire Command Center, (913) Fire Pumps,  
(916) ARCS, (917) Post Fire Smoke Purge Systems,  
(918) Gas Detection Systems*

# BC 911.2: SECONDARY FIRE COMMAND CENTER



Source: [ny-engineers](#)

- Where required in locations described in Appendix G (Flood Requirements) of this code, a secondary fire command center shall be provided subject to the approval of the Fire Department. Design and installation requirements shall be in accordance with NFPA 72.

## Analysis:

- Upgraded previous 2014 BC Appendix G requirements (Indicator Panel) and relocated to 2022 BC 911.2
- When building is in a flood zone, a secondary (back-up) FCC is required; such FCC's design is per NFPA 72, which is reviewed and approved by FDNY
- This is to assure that the fire alarm system is in proper working order in the event of a flood in the building which renders the main FCC to be inoperable.

# BC 913.2.1: PROTECTION OF FIRE PUMP ROOMS



Source: [Pentair.com](https://www.pentair.com)

...  
Exception:

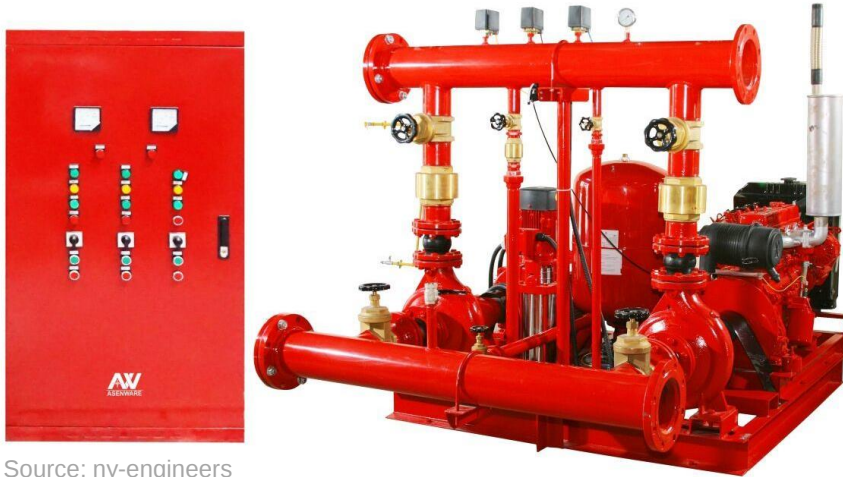
- ...
3. [Fire-rated] separation is not required for a fire pump, other than an automatic standpipe fire pump, where such fire pump is located in a mechanical equipment room, as defined by the New York City Mechanical Code, enclosed by 2-hour fire barriers constructed in accordance with Section 707 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both. Refrigerants, gas piping, gas consumption devices, gas meters or any other gas equipment and fuel storage or fuel consuming appliances shall not be installed in any space housing a fire pump.

## Analysis:

- Exception 3 is modified to allow fire pumps, other than standpipe fire pumps, to be located in the same fire-rated room as other mechanical equipment.
- However, fire pumps are not allowed in the same room as refrigerant, gas or fuel storage, fuel consuming appliances, high voltage electrical equipment, etc.



# BC 913.2.2: CIRCUITS SUPPLYING FIRE PUMPS



Source: [ny-engineers](#)

- Cables used for survivability of circuits supplying fire pumps shall be in accordance with the New York City Electrical Code. Electrical circuit protective systems shall be installed in accordance with their listing requirements, and the New York City Electrical Code

## ***Analysis:***

*This new section modifies requirements for circuit survivability (Circuit Integrity Cabling “CI”) pertaining to fire pumps.*

*NYC Electrical Code Article 695, has three different methods for wiring fire pumps, one of these is “CI.”*

*Coordinated with BC Appendix Q (NFPA 20)*



# BC 913.5: ACCEPTANCE TEST



Source: [vanguard-fire.com](http://vanguard-fire.com)

- Acceptance testing shall be done in accordance with the requirements of Section 1705.30 of this code, the New York City Fire Code and NFPA 20. Refurbished or repaired fire pumps shall be tested in accordance with Section 1705.30 of this code, the New York City Fire Code and NFPA 20. All such tests shall be scheduled to include a department representative as a witness, if required.

## ***Analysis:***

*Coordinate acceptance testing with 2020 BC 1705.30 Special Inspection and NFPA 20 requirements  
DOB Representative must be present during such tests.*

# BC 916.3: WHERE REQUIRED [ARCS]



- ARCS, which shall be in accordance with this section, shall be required in the following:
  - High-rise buildings constructed in accordance with Section 403.
  - Underground buildings constructed in accordance with Section 405.
  - Buildings having a total gross area exceeding 250,000 square feet (23 225.8 m<sup>2</sup>).

Exceptions:

- Group R-2 buildings that meet all of the following requirements:
  - The highest occupied floor is less than 125 feet (38 100 mm) above the lowest level of Fire Department vehicle access
  - The building has no more than 1 story below grade
  - The floor area of the building does not exceed 250,000 square feet (23 225.8 m<sup>2</sup>)
- Where it is determined by the Fire Department that a radio communication system is not required.

## *Analysis:*

*Coordinate acceptance testing with 2020 BC 1705.30 Special Inspection and NFPA 20 requirements  
DOB Representative must be present during such tests.*

# BC 916.3: WHERE REQUIRED [ARCS]

(CONTINUED)



Source: [afap.com](http://afap.com)

## Analysis: (New section)

- New section 916.3 to more clearly identified required installations and added areas where enhanced in-building radio communications are required as determined by FDNY:
- Exceptions were added for R-2 buildings which met several conditions or when FDNY determined that ARCS is not required. The first new exception only requires ARCS in group R-2 buildings that are greater than 125', with only 1-story below grade and does not exceed 250,000SF. This represents the trade off with requiring one-way voice communication at 75' in Group R-2 buildings (BC 907.5.2.2) and clarifies where ARCS would still be needed, e.g. where the building has more than 1 story below grade.



# BC 917.2.4: POST FIRE SMOKE PURGE



Source: [innodez](#)

- **BC 917.2.4 Interior exit stairways or ramps or exit passageways in occupancies other than Group R-2.** Interior exit stairways or ramps or exit passageways shall not be used as a portion of the post-fire smoke purge system in occupancies other than Group R-2. Doors in interior exit stairways or ramps or exit passageways shall not be permitted to be used as a portion of the post-fire smoke purge system. Air transfer and duct openings associated with the post-fire smoke purge system shall not be permitted in the interior exit stairway or ramp or exit passageway.

## **Analysis:**

*This section clarifies that in all non-R-2 occupancies, exit enclosures (exit stairs, exit passageways, etc.) cannot be used as a path for smoke removal when the post-fire smoke purge system is being operated by the fire department.*



# BC 918: GAS DETECTION SYSTEMS



Source: [coned](#)

## **Analysis: (New section)**

Section BC 918 is new and covers various types of gas detection systems. It codifies the design and testing requirements for such systems and includes, sensor locations, emergency power requirements, gas sampling, activation thresholds, alarms, shutoffs, and Fire Department connections.

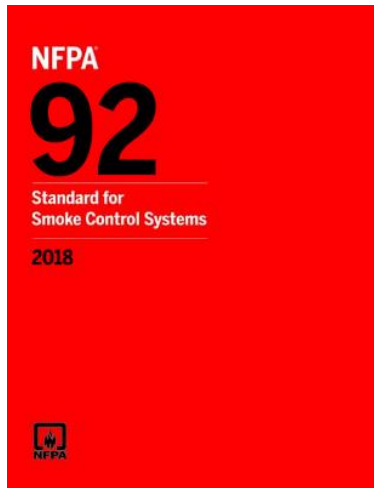
In particular, the need for detection of leaks in hydrogen fuel gas rooms is now required because of other new sections in the NYC Construction Codes that deal with hydrogen fuel gas.

- Gas detection systems, including systems designed to detect flammable, toxic, asphyxiants and other gases, required by the New York City Construction Codes or the New York City Fire Code, shall comply with Sections 918.2 through 918.10 of this code.

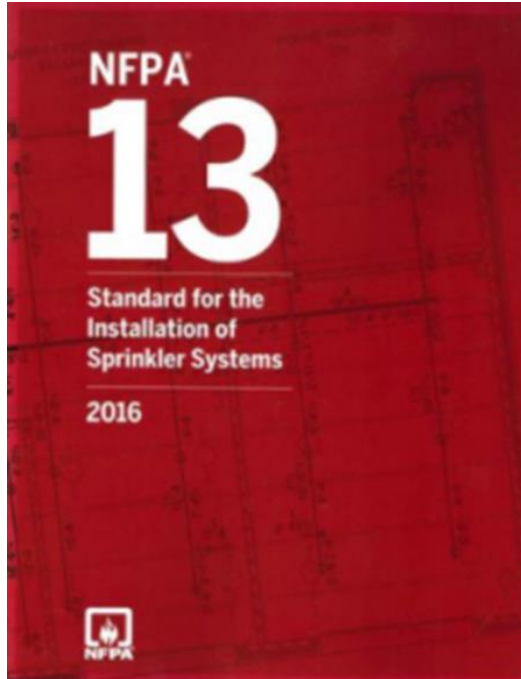
# APPENDIX Q

# BC APPENDIX Q: OVERALL UPDATES

- Q101 was modified to include NFPA 92, Standard for the Installation of Smoke Control Systems (2018 Edition).
- Q102, Q103, Q104, Q105, Q106 and Q107 modified to reference 2016 editions of NFPA 13, 13R, 13D, 14, 20 and 72



# BC APPENDIX Q102: MODIFICATIONS TO NFPA 13



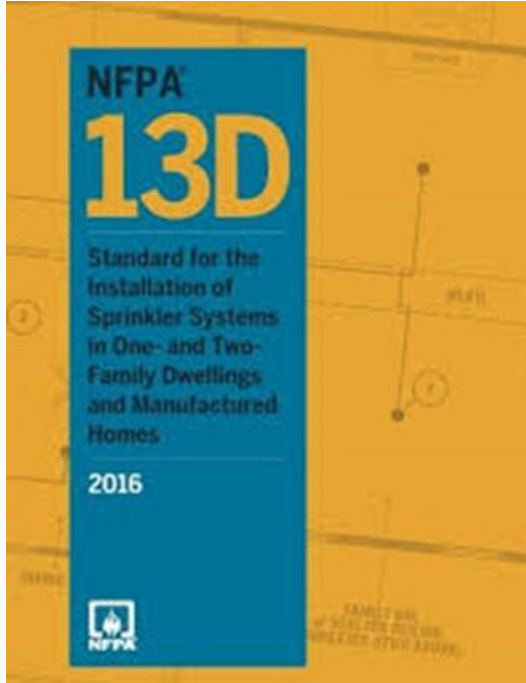
Q102 modifies the updated NFPA 13 Standard for the Installation of Sprinkler Systems (2016 Edition)

## Highlight of NYC Amendments

- Use of nitrogen and other approved gases in dry pipe systems are included – Q102 amendments of the 2016 NFPA 13 were added to address gas supplies, which are now common in other jurisdictions.
- Included 2016 NFPA 13 requirements for interior glazing seeking a fire rating through the use of sprinkler protection, which were modified by Q102 to align with different types of glazing situations, specifically in reference to exterior lot line sprinkler protection.
- Additional text was added to facilitate the installation of pre-action piping
- Added text to address new signage requirements for identifying existing sprinkler systems

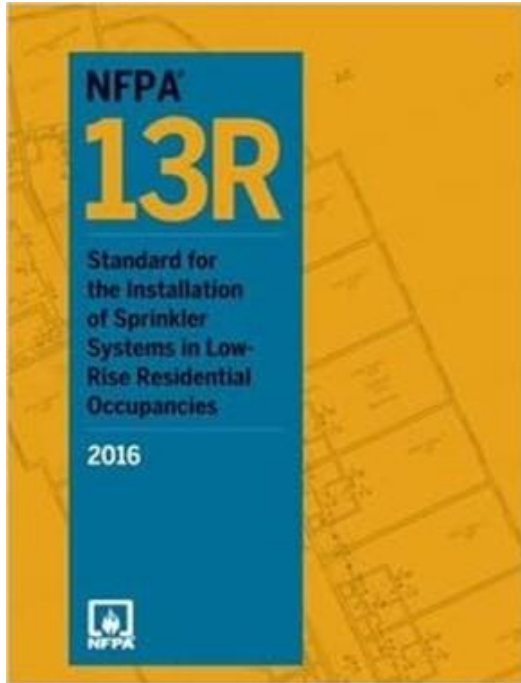


# BC APPENDIX Q103: MODIFICATIONS TO NFPA 13D



- Q103 modifies the updated NFPA 13D Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes (2016 Edition)

# BC APPENDIX Q104: MODIFICATIONS TO NFPA 13R

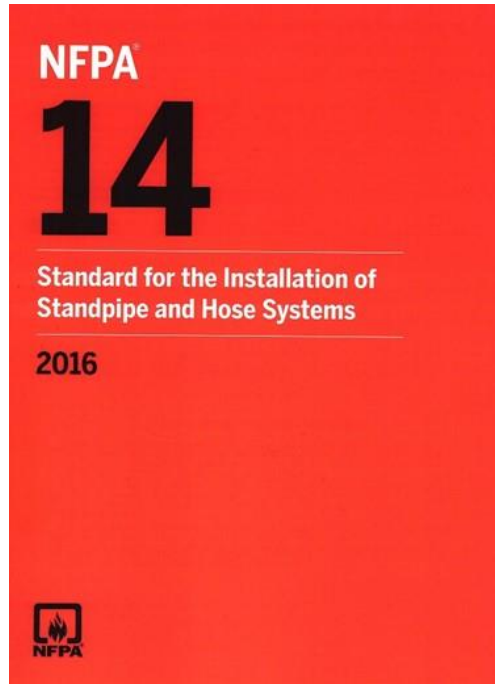


Q104 modifies the updated NFPA 13R Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies (2016 Edition)

## Highlight of NYC Amendments to 2016 NFPA 13R

- Clarifies building height, with respect to number of stories and measured height in feet, need to determine when a building must comply with this standard.
- Includes new NFPA 13R requirements for interior glazing seeking a fire rating through the use of sprinkler protection, which were modified by Q104 to align with different types of glazing situations, such as the fire rating of glazed exterior lot line walls with sprinkler protection

# BC APPENDIX Q105: MODIFICATIONS TO NFPA 14

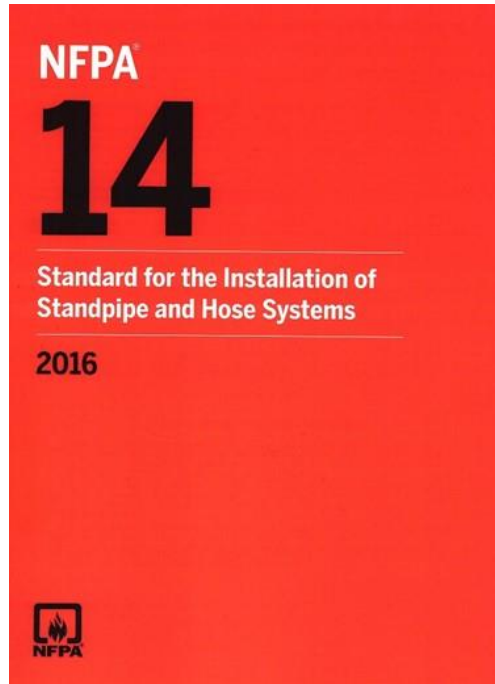


In general, Q105 now modifies the updated NFPA 14 Standard for the Installation of Standpipe and Hose Systems, 2016 Edition.

## Highlight of NYC Amendments

- Clarifies that pressure reducing valves on fire hose outlets, or when located downstream of hose valves, are NOT permitted, which aligns with FDNY standard operating procedures
- Clarifies that the maximum pressure on a standpipe may be imposed by the FDNY when supplying through a Fire Department Connection ("FDC"), which aligns with the 2019 edition of NFPA 14.
- Hydrostatic test pressure requirements for acceptance were clarified. In particular, FDNY may need to impose higher test pressures on the system than the system water supply pressure.

# BC APPENDIX Q105: MODIFICATIONS TO NFPA 14 *(continued)*

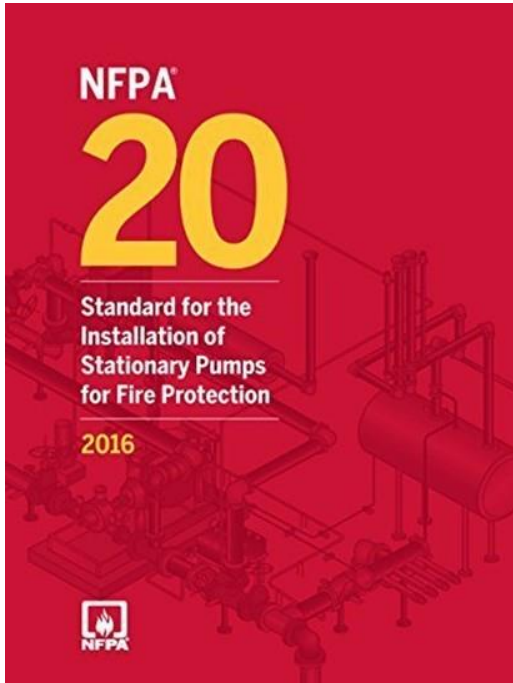


## Highlight of NYC Amendments *(continued)*

- Definitions were added to clearly differentiate “Pressure Restricting Devices” from “Pressure Regulating Devices” and “Pressure Reducing Valves (no amendment to NFPA 14-2016)”
  - Pressure Restricting Devices are at the FDCs
  - Addition of the phrase "..., except for pressure-restricting devices supplying hose outlets" at the end of Sections 5.5.2.1 and 5.5.2.2 for clarity
- Deleted and replaced Section 7.2.4. ‘Master Pressure Reducing Valve (“PRV”) stations’ that are downstream of fire pumps are not permitted in NYC. However, under certain conditions, PRVs could be used, but only if approved by the Building Department Commissioner, likely in consultation with the FDNY.



# BC APPENDIX Q106: MODIFICATIONS TO NFPA 20

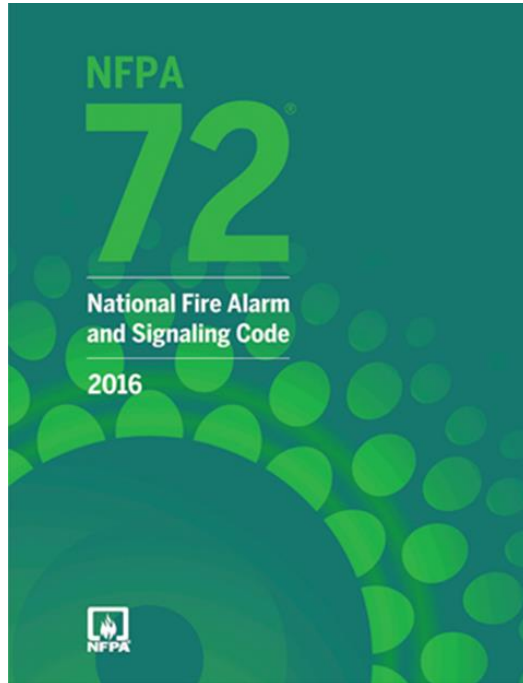


Q106 now modifies the updated NFPA 20 Standard for the Installation of Stationary Pumps for Fire Protection, 2016 Edition

## Highlight of NYC Amendments

- Added section 4.6.2.1.2 - Prevents possible contamination of potable water if draining a fire pump system; in particular, prevents draining back into a combination standpipe/domestic water tank during fire pump acceptance testing.
- Revised section 5.4 & added section 14.2.1.3 to clarify fire pump testing
- Section 10.5.4 was added to clarify that fire pump shutdown shall be performed manually by trained authorized personnel

# BC APPENDIX Q107: MODIFICATIONS TO NFPA 72

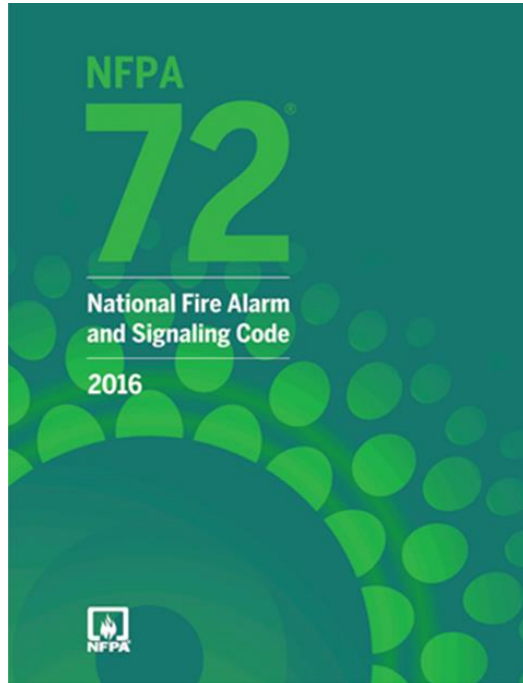


Q107 now modifies the updated NFPA 72 National Fire Alarm and Signaling Code, 2016 Edition.

## Highlight of NYC Amendments

- New Chapter 7 “Documentation” added –Consists mostly of material contained in section 10.18 of 1RCNY 3616-04, which described NYC amendments to NFPA 72.
- Section 10.6.7.2.1 added - Addresses secondary power for two-way radio communication enhancement systems, to more accurately differentiate these requirements from those of the more general fire alarm system.
- Section 12.3.6.2.1 added – Discusses new technology used for Class-N Circuits; FDNY approval for Class-N circuits will be now be through their TM-4 process.

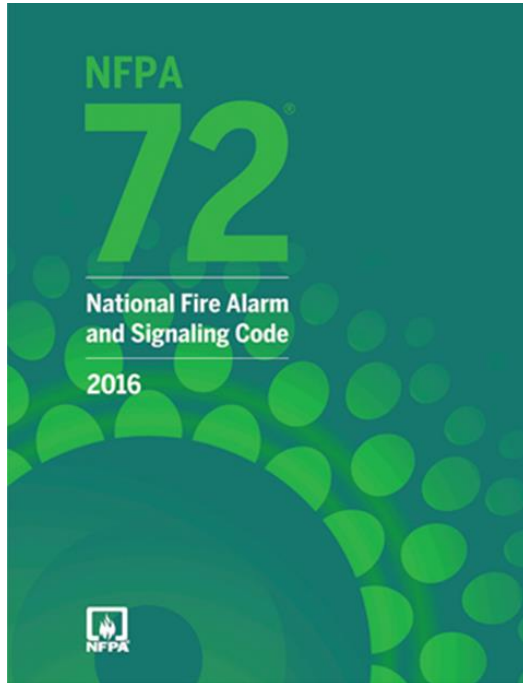
# BC APPENDIX Q107: MODIFICATIONS TO NFPA 72 *(continued)*



## Highlight of NYC Amendments *(continued)*

- Section 14.4.9 was added - ARCS to be inspected and operationally tested in accordance with FDNY operations and rules, thereby also aligning with BC 916.1.2.
- Sections 17.5.3.2.1 & 17.5.3.2.2 were added – Addresses partial & selective coverage smoke detection. Defines “Partial Coverage,” which is used throughout BC 907
- Section 17.10.2.4 now included text from its previous Annex A – Clarifies that an engineering evaluation is to locate gas detection sensors, which is in coordination with new BC 918.
- Section 21.9.1 was added – Clarifies that electrically locked egress doors, if allowed by other sections of the code, must be connected to the fire alarm system.

# BC APPENDIX Q107: MODIFICATIONS TO NFPA 72 *(continued)*

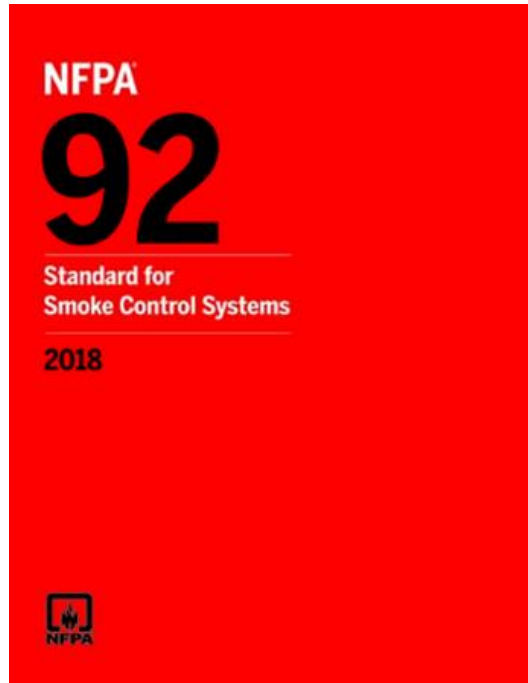


## Highlight of NYC Amendments *(continued)*

- Section 23.8.1.1.3 was added – Updates Event/Non-Event modes of operation for pre-signal systems in accordance with FDNY Bulletins & Variances.
- Sections 24.5 & 24.6 - In-Building Mass Notification Systems or Wide-Area Mass Notification Systems shall not be installed unless approved by FDNY.
- Section 26.6.3 added - Single path transmission, for supervising central office communications, is prohibited.
- Section 26.6.4.1.4 was added to update the means of transmission required for central office connection with new technologies.
- As part of the Hydrogen Fuel Gas package, a new section 17.10.2.4 was taken from the Annex and added to clarify the engineering analysis required for gas detection systems.



# BC APPENDIX Q108: MODIFICATIONS TO NFPA 92



This section was modified to include NFPA 92, Standard for the Installation of Smoke Control Systems, 2018 Edition.

## Highlight of NYC Amendments

- The term “smoke barrier” was deleted from NFPA 92 and replaced with “smoke partition” in all instances. The definition of “smoke partition” in the NYC Building Code aligns with the definition of “smoke barrier” in NFPA 92. This change will assist in avoiding confusion and will not inadvertently require 1-hour smoke barriers in instances where they are not required by the Building Code.



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