




---

## BUILDINGS BULLETIN 2009-018

### Technical

---

**Supersedes:** None

**Issuer:** James P. Colgate, RA, Esq.  
Assistant Commissioner for Technical Affairs and Code Development

**Issuance Date:** October 6, 2009

**Purpose:** This document is provided as a reference guide for the design, installation, operation, and testing of fire alarm systems in high-rise buildings.

<b>Related Code Section(s):</b>	High-rise buildings	
	BC 403	BC 909.12
	BC 403.12	BC 909.16
	Smoke control (Atriums)	BC 909.17
	BC 404.4	Fire command center
	Supervisory service (Fire protection systems)	BC 911
	BC 901	BC 911.1
	BC 901.6	Postfire smoke purge systems
	Automatic sprinkler systems	BC 912
	BC 903.4	BC 912.2
	Standpipe systems	Doors, gates and turnstiles
	BC 905.9	BC 1008
	Fire alarm and detection systems	BC 1008.1
	BC 907	Hoistway venting
	BC 907.2	BC 3004.6
	BC 907.7	Emergency operation and signaling devices
	BC 907.9	BC K101.1 (§2.27)
	BC 907.10	Smoke control systems
	BC 907.14	MC 513.12
	Smoke control systems	MC 513.16
	BC 909	Smoke detection systems control
	BC 909.5	MC 606
		MC 606.4
		Buildings Bulletin 2008-004

**Subject(s):** Fire alarm systems, high-rise buildings; High-rise buildings, fire alarm systems

---

The table that appears in this document incorporates the Construction Codes and Fire Department requirements for the design, installation, operation, and testing of fire alarm systems in high-rise buildings. The scope of the table is limited to high-rise buildings and does not include Group R-2 occupancies.

For the purposes of using the table, the legend is as follows:

<b>R</b> = required	<b>N/A</b> = not applicable
<b>NO</b> = not permitted	<b>O</b> = optional

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

LEGEND: R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices											Status Reporting				
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory	
<b>System Functions</b>																	
<b>AT FIRE COMMAND CENTER ALL OCCUPANCY GROUPS (EXCLUDING GROUP R-2)</b>																	
<b>1. Alert signaling.</b> Audible signal and visible annunciation of alarm device type and location. (BC 907.2, NFPA 72-§4.4.6.2)	-	N/A	R	R	R	R	R	R	R	R	R	R	N/A	N/A	N/A	N/A	
<b>2. Alarm signaling.</b> Manual initiation of controls for standard alarm signals (audible, visible) on selected floors as well as on all floors simultaneously. (BC 907.2.8.3, NFPA 72-§6.3 (BC Appendix Q))	-	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>3. Alarm signaling.</b> Manual station to activate the building's fire alarm system. The manual station shall satisfy the requirements of manual activation of automatic systems (sprinkler, smoke detection, as required by BC Appendix Q). (NFPA 72-§6.8.5.1.2)	-	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>4. Live voice messaging.</b> Manual initiation of "live" voice messages on alarm speakers on selected floors as well as on all floors simultaneously (BC 907.2.12). One-way voice communications via speakers is mandatory in selective evacuation systems. [NFPA 72-§6.9.5.2 (BC Appendix Q)]	-	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>5. Fire Dept. two-way communications.</b> Manual connection with each Fire Dept. 2-way communications device. (BC 907.2.12.3)	e	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>6. Fire Dept. two-way communications.</b> Manual enabling of Fire Dept. 2-way communications device to make floor announcements via speakers on the same floor. (UL 864-§57.1)	e	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>7. Supervisory/Trouble signaling.</b> Audible signal and visible annunciation of supervisory device type and location, or of subsystem supervisory for each subsystem. [BC 911.1.3, NFPA 72-§4.4.6 and §6.10.1 (BC Appendix Q)]	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	R	
<b>8. Supervisory/Trouble signaling.</b> Audible signal and visible annunciation of trouble type and location, or of subsystem trouble for each subsystem. [NFPA 72-§4.4.7 (BC Appendix Q)]	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	R	N/A	
<b>9. Status monitoring.</b> Status of central station transmitter. Required if DACT is an integral part of the Fire Command Center. (NFPA 72-§8.5.4.4)	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	N/A	

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

LEGEND: R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices											Status Reporting				
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory	
<b>System Functions</b>																	
<b>AT FIRE COMMAND CENTER ALL OCCUPANCY GROUPS (EXCLUDING GROUP R-2)</b>																	
<b>10. Transmit to an approved central station (supervising station).</b> Transmit the appropriate alarm signal(s) (manual, automatic, water flow) to central station. (BC 901.6, 905.9, 907.14)	b	N/A	R	R	R	R	N/A	R	R	R	R	R	NO	NO	NO	NO	
<b>11. Transmit to an approved central station (supervising station).</b> Transmit common supervisory signal to central station (BC 901.6, 905.9, 907.14). Supervisory signal for automatic standpipe fire pump shall transmit if only single water source or where any sprinkler booster pump is provided. (BC 901.6, 903.4, 903.4.1)	-	N/A	N/A	N/A	N/A	N/A	O	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	R	
<b>12. Transmit to an approved central station.</b> Transmit common trouble signal to central station. [BC 901.6, 907.14, NFPA 72-§8.2.7 (BC Appendix Q)]	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	R	R	N/A	
<b>13. Acknowledge.</b> Manual initiation of "acknowledge" signal. (NFPA 72-§4.4.3.3, §4.4.3.5, §4.4.3.7, §4.4.3.8)	-	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>14. Air handling systems.</b> Status indicators and controls for air handling systems that require fire alarm shutdown. (BC 911.1, Item No. 5)	d	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>15. Smoke Control.</b> Smoke control system. (BC 909.16, 911.1 Item No. 6, MC 513.12, MC 513.16)	d	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>16. Post-fire Smoke Purge.</b> Manual controls of post-fire smoke purge system. (BC 912.2.3)	d	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>17. System Reset.</b> Manual initiation of system reset. (NFPA 72-§6.9.6.2)	-	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

LEGEND: R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices										Status Reporting				
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory
System Functions																
<b>REQUIREMENTS: ALL OCCUPANCY GROUPS (EXCLUDING GROUP R2)</b>																
<b>18. Doors.</b> Unlock all electrically locked doors in the ingress and egress path (when permitted to be locked). (BC 403.12, 907.10, 1008.1.3.4) Actuation of any Fireman's Service key switch shall unlock fire stairway re-entry doors and all other electrically locked doors permitted in egress path, and shall release smoke doors.	-	R	NO	R	R	R	R	R	R	R	R	R	NO	NO	NO	NO
<b>19. Doors.</b> Release of electrically held open fire or smoke doors. (BC 909.5.2, 907.10, NFPA 72-§5.14.6)	-	O	R	R	R	R	N/A	R	N/A	R	R	R	NO	NO	NO	NO
<b>20. Elevator.</b> Recall all elevators serving alarm floor to the designated level.(BC K101.1, §2.27)	a	N/A	NO	R	NO	NO	N/A	R	R	R	NO	NO	NO	NO	NO	NO
<b>21. Elevator.</b> When the lowest landing of elevators is above the designated level, such as a sky lobby, the actuation of smoke detectors in the sky lobby shall cause such elevators to return non-stop to a floor two (2) stories above the sky lobby, or in the absence of a stop at that floor, to the nearest landing above the sky lobby. [BC K101.1, §2.27.3.2.1(g)]	a	N/A	NO	NO	NO	NO	N/A	R	N/A	N/A	NO	NO	NO	NO	NO	NO
<b>22. Ventilation Fans.</b> Shut down fans over 2000 cfm serving alarm floor. (MC 606.4.2).	d	N/A	O	R	R	R	N/A	R	N/A	NO	R	O	NO	NO	NO	NO
<b>23. Smoke Exhaust.</b> Initiate automatic smoke exhaust or venting of elevator hoistway. (BC 911.1 Items No. 5 and 6, BC 3004.6)	c d	N/A	NO	NO	NO	NO	N/A	NO	R	R	NO	NO	NO	NO	NO	NO
<b>24. Smoke Control in Atrium.</b> Initiate automatic smoke exhaust method in atrium/mall. (BC 404.4, 909.12.2.1, 909.12.3, 909.17) Only alarm initiating devices located within the atrium shall affect notification devices and smoke control in the atrium.	d	N/A	NO	R	R	NO	N/A	NO	N/A	NO	R	R	NO	NO	NO	NO

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

LEGEND: R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices											Status Reporting			
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory
<b>System Functions</b>																
<b>ADDITIONAL REQUIREMENTS: OCCUPANCY GROUPS A-1, A-2, A-3, AND A-4</b>																
<b>25. Alarm signaling in occupied spaces.</b> During periods when not used by the public as an assembly occupancy, on alarm floor, floor below, and floor above: (BC 907.9.1) a. Flash visible signals (strobes) b. Sound standard alarm signal (This item is added to resolve conflict between BC 907.2.1 and 907.2.12.)	b k	N/A	R	R	R	R	N/A	R	O	R	R	R	N/A	N/A	N/A	N/A
<b>26. Alarm signaling in occupied spaces.</b> During periods when not used by the public as an assembly occupancy, on all floors other than the alarm floor, floor below, and floor above: a. Sound standard inquiry tone; or b. Key staff equipped with a personal communications technology device. (FDNY Bulletin No. 07/2008)	b f g k	N/A	R	R	R	R	N/A	R	O	R	R	R	N/A	N/A	N/A	N/A
<b>27. Alarm signaling in occupied spaces.</b> Sound standard alarm signal and flash visible signals on all floors during "after hours" periods if alarm is not acknowledged at the Fire Command Center within 300 seconds.	b c h	N/A	O	O	O	O	N/A	O	O	O	O	O	N/A	N/A	N/A	N/A
<b>28. Live voice messaging.</b> During periods when used by the public as an assembly occupancy, a fire alarm shall initiate a pre-signal system at a constantly attended location, and live voice announcements shall be made to all occupants for the purposes of communicating instructions and/or directing actions to be taken. (BC 907.2.1)	b	N/A	R	R	R	R	N/A	R	R	R	R	R	N/A	N/A	N/A	N/A
<b>ADDITIONAL REQUIREMENTS: OCCUPANCY GROUPS B, M, F, U, E, S-1, S-2, AND H-4</b>																
<b>29. Alarm signaling in occupied spaces.</b> On alarm floor, floor below and floor above (BC 907.2.12.2, 907.9.1.3): a. Flash visible signals (strobes) b. Sound standard alarm signal c. Sound inquiry signal on all floors not in alarm, or alert key staff.	b f g k	N/A	R	R	R	R	N/A	R	O	R	R	R	N/A	N/A	N/A	N/A
<b>30. Alarm signaling in occupied spaces.</b> Sound standard alarm signal and flash visible signals on all floors during "after hours" periods if alarm is not acknowledged at the Fire Command Center within 300 seconds.	b c h	N/A	O	O	O	O	N/A	O	O	O	O	O	N/A	N/A	N/A	N/A
<b>31. Live voice messaging.</b> Initiate a live voice announcement from the FCC. (BC 907.2.12.2) (Buildings Bulletin 2008-004)	b	N/A	R	R	R	R	O	R	N/A	R	R	R	N/A	N/A	N/A	N/A

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

<b>LEGEND:</b> R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices											Status Reporting			
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory
<b>System Functions</b>																
<b>ADDITIONAL REQUIREMENTS: OCCUPANCY GROUPS I-1 AND I-2</b>																
<b>32. Alarm signaling.</b> Audible and visible alarm signal shall annunciate at a constantly attended area, and/or a personal communications technology device shall provide a signal to those staff directly concerned with the implementation and direction of emergency action and initiation and procedures in the area(s) protected by the fire alarm system. (FDNY Bulletin No. 07/2008)	f g	N/A	R	R	R	R	R	R	R	R	R	R	N/A	N/A	N/A	N/A
<b>33. Live voice messaging.</b> Initiate a live voice announcement from the FCC. (BC 907.2.12.2, Exception No. 1)	b	N/A	R	R	R	R	O	R	N/A	R	R	R	N/A	N/A	N/A	N/A
<b>34. Alarm signaling in occupied spaces.</b> On patient floors, flash visible signal (strobes) on alarm floor only. Critical care floors may utilize visual signals only. (BC 907.9.2)	b j k	N/A	R	R	R	R	NO	R	N/A	R	R	R	N/A	N/A	N/A	N/A
<b>35. Alarm signaling in occupied spaces.</b> On non-patient floors, flash visible signal (strobes) and sound an alarm signal on alarm floor, floor below and floor above. (BC, 907.2.12.2, Exception No. 1)	b j k	N/A	R	R	R	R	NO	R	NO	R	R	R	NO	N/A	N/A	N/A
<b>ADDITIONAL REQUIREMENTS: OCCUPANCY GROUP R-1</b>																
<b>36. Signal at fire command center.</b> Audible signal and visible annunciation of a Group R-1 Sleeping Room smoke detector and location, supervisory device type and location, or of a sub-system supervisory for each sub-system. (BC 907.2.8)	-	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	R
<b>37. Alarm signaling in occupied spaces.</b> On alarm floor, floor below and floor above (BC 907.2.12.2, 907.9.1.3): a. Flash visible signals (strobes) b. Sound standard alarm signal c. Sound inquiry signal on all floors not in alarm, or alert key staff.	b f g k	N/A	R	R	R	R	NO	R	O	R	R	R	N/A	N/A	N/A	N/A
<b>38. Alarm signaling in occupied spaces.</b> Sound standard alarm signal and flash visible signals on all floors during "after hours" periods if alarm is not acknowledged at the Fire Command Center within 300 seconds.	b c h	N/A	O	O	O	O	NO	O	O	O	O	O	N/A	N/A	N/A	N/A
<b>39. Alarm signaling in occupied spaces.</b> Sound standard alarm signal in the Sleeping Room/Suite initiating the alarm. (BC 907.2.8.3)	-	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

<b>LEGEND:</b> R = required NO = not permitted O = optional N/A = not applicable	See Ref. Note	System Devices											Status Reporting				
		Manual Initiation from Fire Command Center	Manual Pull Station	Water Flow Detector	Smoke Detector: Duct	Smoke Detector: Area	Smoke Detector: Sleeping Room	Smoke Detector: Elevator Lobby	Smoke Detector: Elevator Hoistway	Smoke Detector: Elevator Machine Room	Automatic detector: Atriums and malls	Subsystem Alarm Contact	Supervisory Signal	Trouble Signal	Sub-system Trouble	Sub-system Supervisory	
<b>System Functions</b>																	
<b>ADDITIONAL REQUIREMENTS: OCCUPANCY GROUP R-1</b>																	
<b>40. Alarm signaling in occupied spaces.</b> Flash visible signals (strobes) only in the individual Accessible Sleeping Rooms/Suites that initiate the alarm. (BC 907.9.1.3)	-	N/A	N/A	N/A	N/A	N/A	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## Fire Alarm System Operating Sequences in High-Rise Buildings (excluding Group R-2)

### REFERENCE NOTES

- a. Elevator recall to be initiated from smoke detector(s) (only if one alarm verification type or two cross-zoned detectors in an elevator lobby, an elevator machine room or hoistway are actuated), or if sprinkler water flows. (BC Chapter 30, BC K101.1, §2.27.3.3.1)
- b. The following signals shall always occur simultaneously: Flashing fire sign, audible alarm signal, visible signals (strobes), transmit signal to FDNY approved Central Station. (supervising station) (BC 901.6.2) Alert signal is the annunciation of alarm to specific locations and key staff (FDNY Bulletin No. 07/2008)
- c. "After regular business hours" periods shall be added and defined as: Periods when less than 100 persons are in the building. (FC 402)
- d. Control and status indications of mechanical equipment related to life safety shall be integrated in the Fire Command Center. (Firefighters Control Panel. BC 909.16)
- e. An FDNY 2-way radio system may be considered for use in lieu of FDNY communications devices except in buildings required to have a "fire safety and evacuation plan" which requires devices (previously referenced as "fire warden phones") for use by building fire warden staff.
- f. Key staff that may be equipped with an approved alert system are identified in FDNY Bulletin No. 07/2008.
- g. An approved alert system is identified in FDNY Bulletin No. 07/2008.
- h. Selection of "regular business hours" period and "after regular business hours" operating mode shall be determined by the building owner's designated representative.
- j. Patient care floors which are above or below the alarm floor may utilize visual signals only. (BC 907.9.2, Exception)
- k. Where an atrium or mall is present, activation of any automatic detection device in that space, or in a fan system serving that space, or in any related space serving that space, it shall be permissible to utilize a pre-signal system in accordance with BC 907.2.13, 907.7. The pre-signal system shall be capable of being switched between private mode and public mode by the system operator.