FIRE DEPARTMENT • CITY OF NEW YORK

STUDY MATERIAL FOR THE CERTIFICATE OF FITNESS

SUPERVISION OF FIRE ALARM SYSTEMS

S-95

This book is provided to the public for free by the FDNY.

All applicants are required to apply and pay for an exam online before arriving at the FDNY. It can take about 30 minutes to complete.

Simplified instructions for online application and payment can be found here:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf

Create an Account and Log in to:

http://fires.fdnycloud.org/CitizenAccess

ALSO INCLUDED IN THIS BOOKLET YOU WILL FIND THE FOLLOWING:

- NOTICE OF EXAMINATION (NOE)
- APPENDIX

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REQUIREMENTS FOR CERTIFICATE OF FITNESS APPLICATION

General requirements:
Review the General Notice of Exam:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special requirements for the S-95 Certificate of Fitness:

- The individuals who have obtained the F-89/T-89/F-80/F-53 Certificate of Fitness will be exempt from having to obtain a separate S-95 Certificate of Fitness for the same premises.
- The applicants who possess the F-89/T-89/F-80/F-53 Certificate of Fitness are allowed to obtain the S-95 Certification of Fitness for a different premises without taking the S-95 exam. However, employer recommendation letter and payment ($25) are still required.

Application fee (Cash is NO LONGER ACCEPTED):

Pay the **$25** application fee online or in person by one of the following methods:

- Credit card (*American Express, Discover, MasterCard, or Visa*)
- Debit card (*MasterCard or Visa*)
- In person: Personal or company check or money order (*made payable to the New York City Fire Department)*

A convenience fee of 2% will be applied to all credit card payments.

For fee waivers submit: ***(Only government employees who will use their COF for their work- related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency

REQUIREMENTS FOR ALTERNATIVE ISSUANCE PROCEDURE (AIP)

This Certificate of Fitness can be obtained by the alternative issuance procedure. Qualified applicants should review and complete the S-95 Certificate of Fitness Alternative Issuance Procedure Application Affirmation Form:

https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-s95-aip.pdf

The AIP applicants must submit the application, required documents and payment on **FDNY Business**:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf

EXAM INFORMATION

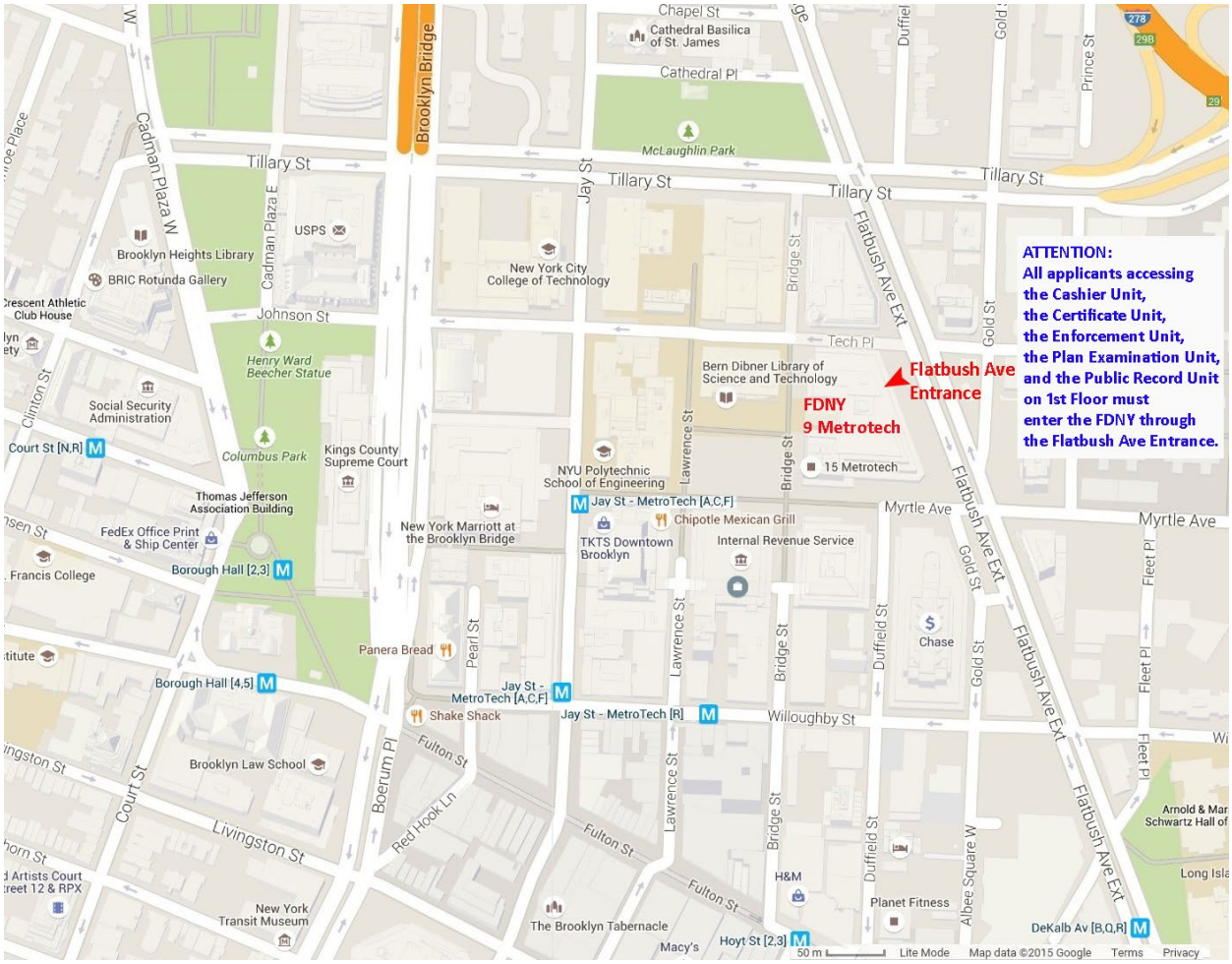
The **S-95** exam will consist of **35** multiple-choice questions, administered on a "touch screen" computer monitor. It is a time-limit exam. Based on the amount of the questions, you will have 53 minutes to complete the test. A passing score of at least 70% is required in order to secure a Certificate of Fitness.

Call (718) 999-1988 for additional information and forms.

Please always check for the latest revised booklet at FDNY website before you take the exam.

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-s95-noe-study-materials.pdf

EXAM SITE: **FDNY Headquarters,** 9 MetroTech Center, Brooklyn, NY. Enter through the **Flatbush Avenue entrance (between Myrtle Avenue and Tech Place)**.



RENEWAL REQUIREMENTS

General renewal requirements:

Review the General Notice of Exam:

https://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special renewal requirements. S-95 Certificate of Fitness: None

QUESTIONS?

FDNY Business Support Team: For questions, call 311 and ask for the FDNY Customer Service Center or send an email to FDNY.BusinessSupport@fdny.nyc.gov.

ABOUT THE STUDY MATERIAL

This study material will help you prepare for the examination for the Certificate of Fitness for Fire Alarm Systems. The study material includes information taken from the NFPA 72 (2010 edition), the new 2014 New York City Fire Code and the existing Fire Rules of the City of New York (RCNY). The study material DOES NOT contain all of the information you need to know to perform your job. It is **your** responsibility to learn anything else that is needed to work with fire alarm systems. It is also **your** responsibility to become familiar with all applicable rules and regulations of the City of New York, even if they are not covered in this material. You should become fully knowledgeable in the fire alarm system installed on your premises. This study material covers all different types of alarm systems.

All questions on the Certificate of Fitness examination are multiple choices, with four alternative answers to each question. Only one answer is correct for each question. If you do not answer a question your answer will be scored as incorrect. A score of 70% correct is required on the examination in order to qualify for the Certificate of Fitness. Read each question carefully before marking your answer. There is no penalty for guessing.

SAMPLE QUESTIONS

The following questions represent the "format" of the exam questions,

not the content of the real exam.

1. Which of the following are allowed to be used while taking a Certificate of Fitness examination at 9 Metro Tech Center?

I. cellular phone
II. study material booklet
III. reference material provided by the FDNY
IV. mp3 player

A. III only
B. I, II, and III
C. II and IV
D. I only

Only reference material provided by the FDNY is allowed to be used during Certificate of Fitness examinations. Therefore, the correct answer would be A. You would touch "A" on the computer terminal screen.

2. If the screen on your computer terminal freezes during your examination, who should you ask for help?

A. the person next to you
B. the firefighters in the testing room
C. the examiner in the testing room
D. the computer help desk

If you have a computer related question, you should ask the examiner in the testing room. Therefore, the correct answer would be C. You would touch "C" on the computer terminal screen.

3. If you do not know the answer to a question while taking an examination, who should you ask for help?

A. the person next to you
B. the firefighters in the testing room
C. the examiner in the testing room
D. you should not ask about test questions since FDNY staff can not assist applicants

You should not ask about examination questions or answers since FDNY staff cannot assist applicants with their tests. Therefore, the correct answer would be D. You would touch "D" on the computer terminal screen.

DEFINITIONS

ACCESSIBILITY: As defined in NFPA admitting close approach: not guarded by locked doors, elevation, and other effective means.

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

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

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

APPROVED CENTRAL STATION COMPANY: A central station company that has been issued a valid certificate of operation from FDNY.

ARCS (Auxiliary Radio Communications System): In-Building Emergency Radio Communication Systems. ARC system is a wireless two-way building communication system for Fire Department use only.

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

DEFINED FIRE ALARM SYSTEM: A fire alarm system or any sub-system thereof that automatically transmits signals to the department or a central station and that is installed in premises which are required to have a fire alarm system.

DESIGNATED REPRESENTATIVE: A person or entity designated by the subscriber who shall be responsible for receiving notifications from the central station company concerning the status of the protective signaling system at the protected premises and who is authorized to take action with respect to such system.

FIRE ALARM CONTROL UNIT (FACP, FCS): A system component that receives inputs from automatic and manual fire alarm devices and is capable of supplying power to detection devices and transponder(s) of off-premises transmitter(s). The control unit is capable of providing a transfer of power to the notification appliances and transfer of condition to relays of devices.

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

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

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

IMPAIRMENT COORDINATOR: The person responsible as designated by the owner for ensuring that proper safety precautions are taken when a fire protection system is out of service.

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

SMOKE DETECTOR MAINTENANCE: Work, including, but not limited to, repair, replacement, and service, performed to ensure that equipment operates properly.

SHALL. Indicates a mandatory requirement.

NUISANCE ALARM: Any alarm caused by mechanical failure, malfunction, improper installation, or lack of proper maintenance, or any alarm activated by a cause that cannot be determined.

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

PLENUM: The open space that carries air between the ceilings and floor above.

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

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

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

SMOKE DETECTOR: A listed device that senses visible or invisible particles of combustion that is connected to a fire alarm system.

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

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

UNNECESSARY ALARM: An alarm signal transmitted by a fire alarm system which functioned as designed, but for which a department response proved unnecessary. An example of an unnecessary alarm is an alarm triggered by smoke from a lit cigarette in a non-smoking area, when the presence of such smoke does not implicate fire safety concerns.

UNWARRANTED ALARM: An alarm signal transmitted by a fire alarm system which failed to function as designed as a result of improper installation, improper maintenance, malfunction, or other factor. Examples of unwarranted alarms are alarms resulting from improper smoke detector placement, improper detector setting for installed location, lack of system maintenance, and control panel malfunction. It is important to know that the alarm verification feature reduces the number of unwarranted alarms.

1. SUPERVISION OF FIRE ALARM SYSTEMS

The Fire Code that was adopted in July 2008 vastly changed the requirements for the supervision of all fire alarm systems. The code prior only required supervision for Interior Fire Alarm Systems. The 2008 Fire Code affects thousands of fire alarm systems in buildings which previously did not require a Certificate of Fitness holder (C of F). Fire Alarm Systems installed in New York City are subject to the regulations enforced by the FDNY. This study material will provide information so that applicants can properly prepare for the examination.

An approved fire alarm system might typically be found in assembly occupancies (e.g. theaters, school auditoriums), business occupancies, education occupancies, factories, malls, hotels, etc. Any approved fire alarm system must be supervised by a Certificate of Fitness holder depending upon the nature of the occupancy and/or the type of fire alarm system. See the table below for various examples.

Fire alarm system and/or building occupancy	**C of F requirement**
Fire alarm system has two-way voice communication system with warden phone	FLSD
Fire alarm system installed in a commercial/mixed high rise building	FLSD
Fire alarm system with one and/or two way communication, installed in a hotel building contains 50 or more sleeping rooms above ground floor.	FLSD
Fire alarm system in a homeless shelter not requiring a FLSD	F-80
Fire alarm system with one way communication system (public announcement system), not requiring an FLSD/F-80	F-53
Fire alarm system without voice communication system and not requiring an FLSD/F-80/F-53	S-95

F-80: Coordinator of Fire Safety and Alarm System in Homeless Shelters
F-89/T-89: FLSD
S-95: Supervision of Fire Alarm Systems

As the table mentioned above, if there is no FLS Director or F-80 C of F holder required on the premises, **any approved fire alarm system without voice communication system must be under supervision of an S-95 Certificate of Fitness holder.**

A fire alarm system may include but not limit to one/some of the following systems:

1. Standpipe fire pump
2. Sprinkler booster fire pump
3. Standpipe(limited service fire pump)

4. Other (specify)
5. Emergency voice/alarm communication system
6. Fire Department communication system
7. Carbon monoxide alarms and detectors
8. Automatic sprinkler systems
9. Alternative automatic fire-extinguishing system
10. Automatic fire alarm systems
11. Manual fire alarm systems
12. Manual and automatic fire alarm systems
13. Emergency alarm systems (gas detection system)
14. Smoke control systems
15. Fire command center
16. Post-fire smoke purge systems
17. Sub-systems (Range hood, halon and FM200 etc.)
18. Auxiliary Radio Communication System (ARCS)

All Certificate of Fitness holders should ensure that their respective premises have fire alarm systems approved by the FDNY. For further questions, you can contact your Building owner or Property Manager. (See sample of the "**Letter of Approval**" in the Appendix A of this study material).

2. FIRE ALARM SYSTEMS

The scope of each Certificate of Fitness title differs and it is critical that holders of each category know their limitations. Holders of the S-97or S-98 may perform the responsibilities of holders of the S-78/F-78 C of F; however, S-78/F-78 holders cannot perform the functions of an S-97/S-98 holder (see chart below).

	May be performed by		
Duties can be performed by C of F Holders	**S-95**	**S-78/F-78**	**S-97/S-98**
Visual inspection of smoke detectors	**Yes**	**Yes**	**Yes**
Visual inspection of other fire alarm system components	**Yes**	**NO**	**Yes**
Smoke detector inspection, testing and cleaning	**NO**	**Yes**	**Yes**
Smoke detector maintenance	**NO**	**NO**	**Yes**
Program, service, clean, test, repair and/or replace low voltage fire alarm system components	**NO**	**NO**	**Yes**

Fire alarm systems are required in many premises as part of a fire protection system. The new Fire Code has expanded the requirements for fire alarm systems which include but are not limited to the following buildings:

- OFFICE BUILDINGS
- SHELTERS
- HOSPITALS
- MARINAS
- COMMERCIAL
- HOTELS
- MOTELS
- SCHOOLS
- APARTMENT BUILDINGS which may be high-rise or low-rise, or as specified in New York City Building Code section 309.1.

A Fire Alarm System is a system consisting of components and circuits arranged to monitor and annunciate the status of fire alarm and supervisory signal-initiating devices, and to initiate the appropriate response to these signals.

THE PRIMARY PURPOSE OF FIRE ALARM SYSTEMS WITHIN PROTECTED PREMISES IS TO WARN BUILDING OCCUPANTS AND TRANSMIT SIGNALS INDICATING A FIRE CONDITION TO THE FIRE DEPARTMENT VIA AN FDNY APPROVED CENTRAL STATION COMPANY.

Fire alarm systems are required in various types of occupancies. Some examples of such occupancies are hotels, shelters, hospitals, office buildings and mercantile occupancies. If a fire emergency occurs the alarm system notifies the occupants of the building.

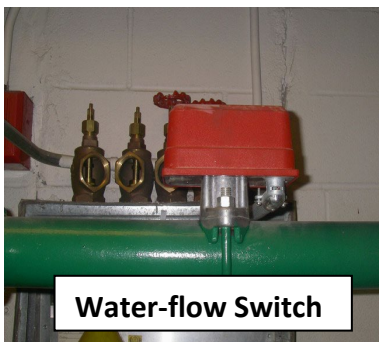
3. COMPONENTS OF THE FIRE ALARM SYSTEM

3.1 FIRE ALARM CONTROL PANEL (FACP)

FACP is a system component that monitors inputs and control outputs through various circuits. The primary purpose of the fire alarm control panel is to process signals received from initiating devices and to activate appropriate signals and outputs.

3.2 THREE TYPES OF SIGNALS INITIATED BY FACP

3.2.1 Fire Alarm Signal: A signal initiated by a fire alarm initiating device such as a manual fire alarm pull station, smoke detector, water-flow switch, or other device in which activation is indicative of the presence of a fire or fire signature.



When a fire signal is generated, the FACP activates the building audible and visual devices connected to the fire alarm (i.e. horn/strobes), sends a signal to an FDNY approved central station, and actuates control of certain building functions.

Central station operators shall monitor and process all fire alarm signals before any other signals, regardless of the order in which they are received. When they receive fire alarm signals, operators at the central station re-transmit those signals to the Fire Department.

Alarm signals shall be re-transmitted to the Fire Department immediately upon receipt of the signal at the central station. A signal is deemed to be received at the time it is processed by the automation software. The operator shall also notify the premises after retransmitting the signal to the Fire Department. Alarm signals transmitted to the Fire Department shall indicate the type of alarm received (e.g., automatic, valve, manual or carbon monoxide). EVERY fire alarm signal must be re-transmitted immediately to the FDNY as a fire alarm signal even if it is automatically restored by the premise fire alarm system. There are NO EXCEPTIONS**.**

3.2.2 <u>Supervisory Signals:</u> A supervisory signal indicates that a system or device being monitored has been compromised or is in an abnormal state. A supervisory signal will audibly and visually annunciate at the FACP to indicate the supervisory condition needs to be investigated and corrected. The FACP will also send a supervisory signal to an FDNY approved central station.

Supervisory signals are generated from initiating devices such as:

1. Valve supervisory switch on a sprinkler system
2. High/Low water level switch on a gravity tank feeding a sprinkler system
3. Low air pressure switch from a dry pipe sprinkler system
4. Fire pump running/pump failure/pump phase reversal

Note: The FDNY is not dispatched to respond to supervisory signals. Supervisory signals are not indicative of a fire condition.

3.2.3 <u>Trouble Signals:</u> Fire Alarm Control Panels are provided with means to detect and signal trouble conditions. Trouble signals indicate that the alarm system, transmitter, or communications path is wholly or partially out of service. Common trouble conditions monitored by a Fire Alarm Control Panel are battery condition, AC failure, ground fault, open or short circuit on a wire, phone line failure, or internal component failure.

Upon receipt of trouble signals or other signals pertaining solely to equipment maintenance of an alarm system, the central station shall communicate immediately with persons designated by the subscriber. Routine handling should

take a maximum of four minutes from receipt of a trouble signal by the central station until initiation of the investigation by telephone.
A Central Station will occasionally experience unusual circumstances resulting in an inordinate amount of trouble signals received simultaneously, such as a power failure encompassing a large area.

A trouble signal will ordinarily annunciate audibly and visually at the Fire Alarm Control Panel to indicate the trouble condition, which needs to be investigated and corrected.
Note: The FDNY is not dispatched to respond to trouble signals. Trouble signals are not indicative of a fire condition.

LAMP TEST: This function is used on some FACP's to check the condition of the light emitting diodes (LEDs) on the FACP.
REMOTE ANNUNCIATOR PANEL: A remote annunciator panel when installed shall function for visual notification of alarm, supervisory or trouble conditions only.

3.3 SUB-SYSTEM
A Sub-System is an activating (voluntary or required) system installed in a specific area or floor for a specific purpose in a building that has a required (mandated) base building fire alarm system.

All Sub-Systems include but are not limited to the following; **Halon, FM200, Water Mist, Pre-Action, Range Hood, Carbon Dioxide, Foam system, Dry Chemical, Smoke Detection, Clean Air Agents** or **Thermostatic Systems** shall be subject to Fire Department inspection and test for issuance of Letter of Approval for such Sub-System(s).

All such Sub-Systems shall be maintained in proper working order, and a person holding a Certificate of Fitness shall be in charge of the supervision and maintenance of all such activating system. All Sub-Systems shall be interconnected to the base building fire alarm system for alarm and trouble supervision and shall annunciate specific type and location of such sub-system(s). Activation of the sub-system shall activate the base building audible and visual appliances and notify the Fire Department via the base building Central Station.

4. IN CASE OF AN ALARM
4.1 ACKNOWLEDGE SWITCH OR BUTTON
An acknowledge button, also abbreviated as (ACK) is used to acknowledge alarm, trouble or supervisory conditions. The sequence and procedures may differ in

every fire alarm system; however, it is important for the C of F holder, when present and practical, to report to the FACP location whenever the alarm is activated.

4.2 ALARM SILENCE SWITCH OR BUTTON

The alarm silence switch is used to silence the building audible and visual devices (such as sirens, bells or gongs) after an evacuation is complete while the source of alarm is being investigated. Never reset the fire alarm system until the condition is verified by the FDNY personnel. Depending on the configuration of the alarm system, this function will either silence the system's notification appliances completely, or will silence only the audible alarm, with strobe lights continuing to flash. However, the silence switch does not prevent a signal from being transmitted to a FDNY approved central station company. Audible silence allows for easier communication for emergency responders while responding to an alarm.

4.3 SYSTEM RESET SWITCH OR BUTTON

This switch is used to reset the fire alarm system after an alarm condition has been cleared. All initiating devices should return to normal condition after manually resetting. If an initiating device is still in alarm after the system is reset, such as smoke detectors continuing to sense smoke, or a manual pull station still in an activated position, another alarm will be generated. Most trouble and supervisory conditions will clear automatically when conditions are returned to normal. After a fire alarm is reset, the fan usually requires restarting from a separate “fan restart” button or key switch.

A FACP indicating an alarm signal cannot be reset to “normal” if the device or devices signaling the alarm to the FACP have not returned to “normal” from “alarm”.

DO NOT SILENCE BUILDING AUDIBLE VISUAL DEVICE OR RESET THE FIRE ALARM PANEL UNTIL THE FIRE ALARM CONDITION IS VERIFIED BY THE FDNY PERSONNEL.

4.4 TYPES OF DEVICES, AND SIGNALS THEY GENERATE

TYPE OF DEVICE	ACTIVATED BY	TYPE OF SIGNAL	ACTION NORMALLY REQUIRED TO RETURN DEVICE TO "NORMAL" CONDITION
Manual pull station	Manually pulling handle	Fire Alarm	Return handle to normal position. A key or other method may be required to reset the station to a normal condition.
Smoke, beam, and duct detectors	Detection of particles of combustion ***see note below**	Fire Alarm	Smoke detectors will normally reset when the reset button is pressed at the FACP if the condition activating the detector has been cleared.
Heat detectors	Abnormally high temperature (fixed temperature detector) or rapid temperature rise (rate of rise detector)	Fire Alarm	After activation most **Fixed temperature** heat detectors will not self restore and will require replacement by a qualified service technician. **Rate of rise** detectors will normally self-restore after activation.
Water-flow device	Flow of water in a sprinkler system	Fire Alarm	Device should return to normal when water ceases to flow.

NOTE: There are other circumstances which will cause a smoke detector to signal an alarm condition when there is none, creating false alarms and causing unnecessary Fire Department responses. Care must be taken at all times to protect all smoke detectors from the entrance of foreign particles which may be airborne. Dust from cutting wood, sheet rock or sanding may trigger a false alarm. Smoke detectors which have not been properly cleaned and maintained will also create false alarms.

SMOKE DETECTORS MUST BE:

(*1*) cleaned not less than once every six (6) months, except for analog (intelligent) *smoke detector*s, which shall be cleaned no later than one (1) week from receipt of an indication of the need for cleaning.

(*2*) tested for smoke entry not less than once a year.

BY ANY OF THE FOLLOWING: S-78, S-97, OR S-98 CERTIFICATE OF

FITNESS HOLDER.

ALL ABNORMAL CONDITIONS MUST BE INVESTIGATED AND NOTED IN THE LOG BOOK.

5. FIRE ALARM SYSTEM POWER SUPPLIES

Buildings with fire alarms are required to have primary and secondary power supplies.

5.1 PRIMARY POWER SOURCE

All fire alarm circuits shall be provided with a primary power source. The primary power source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power or isolated plant. The primary power supply to the fire alarm system shall comply with the following:

- **Primary Power Supply for the Fire Alarm System.** Primary power supply for the fire alarm system shall be connected to the primary power source ahead of all building service disconnecting means so that the building service disconnecting means can be opened without de-energizing the fire alarm supply. All utility metering of the fire alarm system, including disabling or removal of meters, shall maintain power continuity to the fire alarm system at all times.

- **Limited Interior Fire Alarm System.** Primary power supply for sub-systems or other limited interior fire alarm systems may be connected to the power supply through the protected area of such systems by means of a connection ahead of the disconnecting means for the power supply to the protected area.

5.2 SECONDARY POWER SOURCE

Where an emergency power system is provided or required to be provided for emergency system loads, the fire alarm circuits shall be provided with a secondary power source. Batteries shall not be a substitute for connection to a secondary power source. The secondary power source shall comply with the requirements for emergency power systems and/or emergency generator that are used for emergency systems loads as articulated below:

- **Generally.** Emergency power systems complying with Chapter 27 of the 2008 Building Code shall be permitted to serve as a secondary power source or

- **Existing Buildings.** Emergency power systems and/or emergency generators in existing buildings in compliance with Title 27, chapter 1, subchapter 6, section 27-396.4 of the Administrative Code (also referred to as the 1968 Building Code) shall be permitted to serve as the secondary power source.

The secondary power supply shall be connected such that all other disconnecting means serving other building emergency loads can be opened without de-energizing the facility fire alarm secondary power supply.

6. INITIATING DEVICES

An automatic fire alarm system is a system which sounds a signal when a fire detection device indicates that there is a fire.

An automatic fire detector is an initiating device which detects the presence of a fire condition and initiates action. This includes the detection of the presence of smoke/and or heat.

As stated in the NYC Fire Code, the term initiating device covers not only fire detection devices such as heat detectors and smoke detectors, but also other devices that monitor conditions related to fire safety (NFPA 72).

Initiating devices, such as a smoke detector, shall be installed in a manner that provides accessibility for periodic cleaning and testing (Fire Code). Accessibility is defined in the NFPA as "admitting close approach: not guarded by locked doors, elevation, and other effective means." The installer, as well as certified personnel, shall apply this to all system components requiring maintenance and where security is not an issue. If special equipment, such as a man-lift is necessary to install or maintain any detection devices, the installer shall ensure that the building owner understands that this special equipment will be needed for future testing and cleaning of those devices.

6.1 SMOKE DETECTORS

A smoke detector is a device that detects visible or invisible particles of combustion. Smoke detectors have been shown to be very effective in reducing fire damage and loss of life.

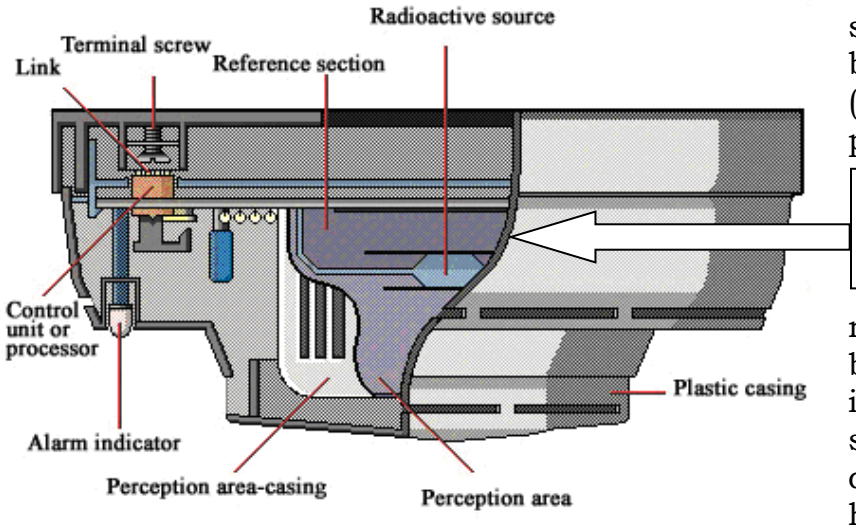
Smoke detectors detect most fires much more rapidly than heat detectors. They automatically detect a fire by sensing smoke particles. The smoke particles may be visible or invisible to the human eye.

Smoke detectors are fragile devices. Where smoke detectors are subject to mechanical damage, they shall be protected. A protective guard used to protect a smoke detector shall be listed for use with that detector (example pictured on the right) (NFPA 72). When smoke detector reports the need for maintenance to the fire alarm control panel, it must be cleaned within 1 week.

Smoke detectors are helpful in two very important ways:

1. Smoke detectors can provide an early warning of a fire.

2. Occupants can evacuate the building immediately because of the early warning.

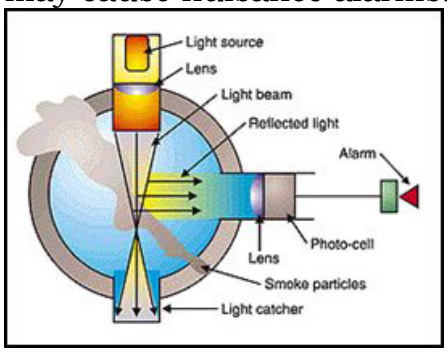


Anatomy of a typical smoke detector

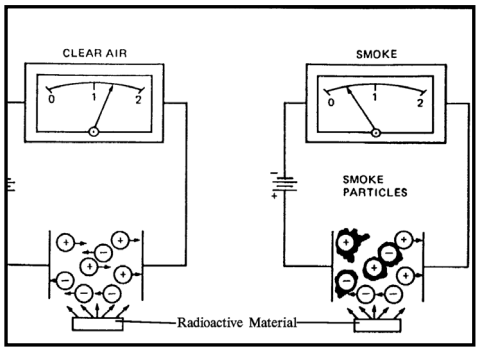
There are several kinds of smoke detectors. Most smoke detectors work either by optical detection (photoelectric) or by physical process (ionization) while multi-sensor detectors use both detection methods to increase sensitivity to smoke. Modern smoke detectors also may have a heat sensor built in.

a. <u>Ionization detectors</u> use an **ionization chamber** and a source of ionizing radiation to detect smoke. This type of smoke detector is better at detecting the smaller amounts of particles of combustion produced by flaming fires. Ionization smoke detectors monitor '**ions,**' or electrically charged particles in the air. Air molecules in a sample chamber of ionization smoke detectors are 'ionized' by a radioactive source. This allows a small electrical current flow. Smoke particles entering the sensing chamber change the electrical balance of the air. The greater the amount of smoke, the higher the electrical imbalance. When combustion particles enter the smoke detector, they obstruct the flow of the current. When the current gets too low, the system actives the alarm.

b. <u>Photoelectric detectors</u> are better at sensing smoky fires, such as those caused by a smoldering mattress. Light from the light source in a photoelectric detector may be reflected off the walls of the sensing chamber, and be seen by the photosensitive device when no smoke is present. Insects, dirt, drywall dust, and other forms of contamination can accumulate in the sensing chamber and reflect light from the light source onto the photosensitive device; as a result detectors may cause nuisance alarms.



Photoelectric Detector

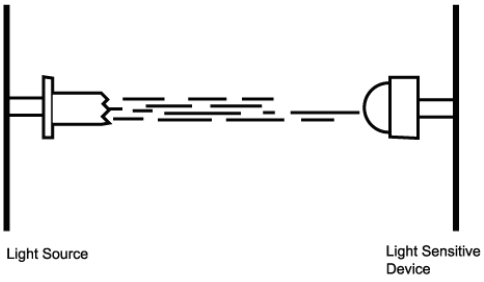


Ionization Detector

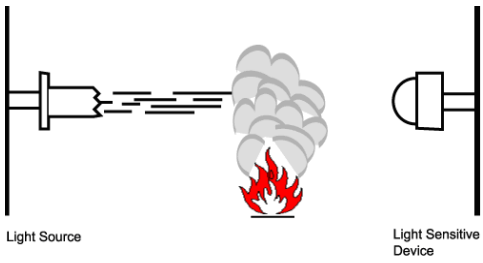
is provided to

c. <u>Projected beam-type detectors</u> shall be kept clear of opaque obstacles at all times (NFPA 72). The beam length shall not exceed the maximum permitted by the equipment listing (NFPA 72). The maximum beam length is determined by the maximum distance at which the detector can maintain its design stability even when some normal light obscuration is present (NFPA 72). The beam shall be designed so that small angular movements of the light source or receiver do not prevent operation because of smoke and do not cause **nuisance alarms** (NFPA 72). If mirrors are used with projected beams, the mirrors shall be installed in accordance with the manufacturer's documented instructions (NFPA 72).

d. <u>Photoelectric light-obscuration smoke detectors</u> are area or projected beam-type smoke detectors and use the principle of a light source and a photosensitive sensor. When smoke particles enter the light path, some of the light is scattered and some is absorbed, thereby reducing the light reaching the receiving sensor. The light reduction signal is processed and used to convey an alarm condition when it meets preset criteria (see images below) (NFPA 72).

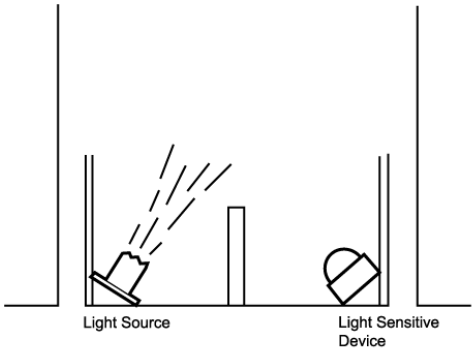


Light Obscuration Detector

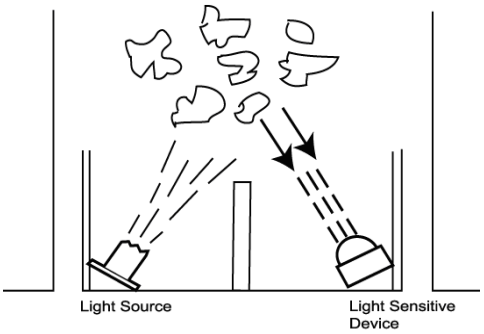


Light Obscuration Detector with Smoke

e. <u>Photoelectric light-scattering smoke detectors</u> are projected beam type detectors that use a light source and photosensitive light source. A photosensitive sensor is arranged so that the rays from the light source do not normally fall onto the photosensitive sensor (see images below). When smoke particles enter the light path, some of the light is scattered by reflection and refraction onto the sensor. The light signal is processed and used to convey an alarm condition when it meets preset criteria (NFPA 72).



Light Scattering Device



Light Scattering Device with Smoke

6.2 COMBINATION SENSING TECHNOLOGY SMOKE DETECTORS

- **Multi-criteria Detector** a initiating device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. This sensor is capable of generating only one alarm signal from the sensors employed in the design either independently or in combination.

- **Multi-sensor Detector** a device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. A device capable of generating multiple alarm signals from any one of the sensors employed in the design, independently or in combination. The sensor output signals are mathematically evaluated to determine when an alarm signal is necessary.

- **Combination detector** a device that either responds to more than one of the fire conditions or employs more than one operating principle to sense one of these conditions. Typical examples are a combination of a heat detector with a smoke detector or a combination rate-of-rise and fixed-temperature heat detector. Normally, a "Combination Detector" provides a single response from either sensing method, each of which operates independent of the other. This device has listings for each sensing method employed.

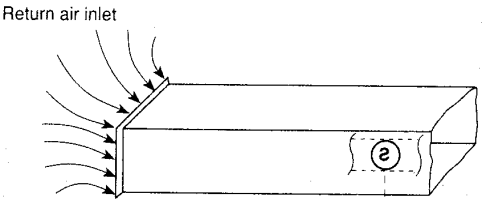
- **Beam detectors** are used to protect large areas where spot type area smoke detectors are not practical. It is a light beam that when broken by any combustible particles will set the detector. (Specialty device approved by the Commissioner of The City of New York Fire Department).

- **Elevator lobby smoke detectors** are smoke detectors that when activated will recall elevators automatically to the designated landing.

- **Duct smoke detectors** are used to help prevent smoke from spreading from the fire area to other parts of the building by shutting down the HVAC system. They also may be used to help protect the air handling equipment by shutting down the system if the fan or filter should start burning. When used with smoke control systems to re-direct the airflows in the building, they control smoke dampers in the ductwork, thus changing the direction of airflow, instead of shutting down the HVAC units.

Duct Smoke Detector

Proper preventative measures shall be taken to protect all fire alarm initiating devices i.e. smoke, heat and duct detectors especially during construction.



Detectors placed in environmental air ducts or plenums shall not be used as a substitute for open area detectors (NFPA 72). Air duct smoke detectors work by detecting smoke and control air movement by air conditioning and ventilating systems (pictured on the right). These detectors should be tested or inspected to ensure that the device samples the airstream (NFPA 72).

It is imperative that air movement be shut down in the event of a fire. Fire alarm systems are therefore interfaced to HVAC systems so that an alarm signal from the fire alarm system will cause the air handling systems in the area of the alarm to shut down.

Air duct smoke detectors may use photoelectric or cloud chamber principle of operation. Smoke might not be drawn into ducts or plenums when the building ventilation system is shut down. When the ventilation system is operating, the duct detector(s) can be less responsive to a fire condition in the room of fire origin because of dilution by clean air. The location of all detectors in air duct systems shall be permanently and clearly identified and recorded. Detectors mounted outside of a duct that employs sampling tubes for transporting smoke from inside the duct to the detector are designed and placed to allow verification of airflow from the duct to the detector (NFPA 72).

Air Sampling type smoke detectors that are placed in ducts use a sampling tube to draw a sample of air from the hazard area to the detector where the presence of visible smoke or invisible combustion products is determined. Each sampling port of an air sampling-type detector shall be treated as spot-type detector for the purpose of location and spacing (NFPA 72). The maximum air sample transport time from the farthest sampling point shall not exceed **120 seconds** (NFPA 72). Air-sampling detectors shall give a **trouble** signal if the airflow is outside the manufacturer's specified range. The sampling ports and in-line filter, if used, shall be kept clear in accordance with the manufacturer's documentation instructions (NFPA 72).

6.2.1 SMOKE DETECTOR FEATURES THAT INCREASE THEIR ABILITY TO PROVIDE FIRE PROTECTION.

1. Addressable System Smoke Detectors: provide an alarm indication to a control unit. In addition, they also signal the location of the alarm.

2. Intelligent System Smoke Detectors: these types of smoke detector systems send information about smoke conditions to the control unit. The detector indicates the location of the alarm and provides environmental change information to the panel.

3. Smoke detectors with control output functions: when smoke detectors are installed on an initiating device circuit and are used for controlling operations (e.g., fan shutdown or elevator recall) with other devices installed on the same circuit, the control function must perform correctly, even with all other devices on the circuit in an alarm condition. The maximum allowable time for fire alarm output functions to operate once a smoke detector has been activated is 10 seconds.

6.2.2 BUILDING FIRE PROTECTION FEATURES - ACTIVATED BY THE FIRE ALARM SYSTEMS

1. Smoke Dampers: Smoke dampers open and close when required to provide fresh air or to stop smoke passage.

2. Fire Dampers: Fire dampers close when a rise in temperature occurs and stay shut to stop fire from passing through a barrier.

3. Elevator Recall: The fire alarm system integrates with elevator controls to recall elevator cars to a designated landing floor in the event of an alarm.

4. Door Release (where connected to FACP): The fire alarm system will actuate a relay to release door holders so those doors will automatically close to provide a smoke barrier between two areas.

6.3 HEAT DETECTORS

A sensor that detects abnormally high temperatures or rate of temperature rise. Heat detectors have been shown to be very effective in reducing fire damage. An illustration of a heat detector is shown below:

Heat detectors are available in two general types: **rate-of-rise and fixed temperature.**

Heat detector

Heat detectors can only be tested by authorized fire alarm technicians. C of F holders are responsible for ensuring that operational heat detectors are in place. They must notify fire alarm maintenance companies to make all necessary repairs.

a. Rate-of-rise heat detectors activate the alarm when the room temperature increases at a rapid rate. This type of detector is more sensitive than the fixed temperature detector. The rate-of-rise heat detector **does not** have to be replaced after it has activated the fire alarm. All heat detectors require special attention. They must be carefully installed according to the manufacturer's instructions.

Rate-of-rise heat detector

b. Fixed-temperature heat detectors activate the alarm when the detector components melt at a preset temperature level. The fixed-temperature heat detectors normally require replacement after they have sounded an alarm. However, intelligent heat detectors will usually reset themselves. For further information, contact your fire alarm service provider.

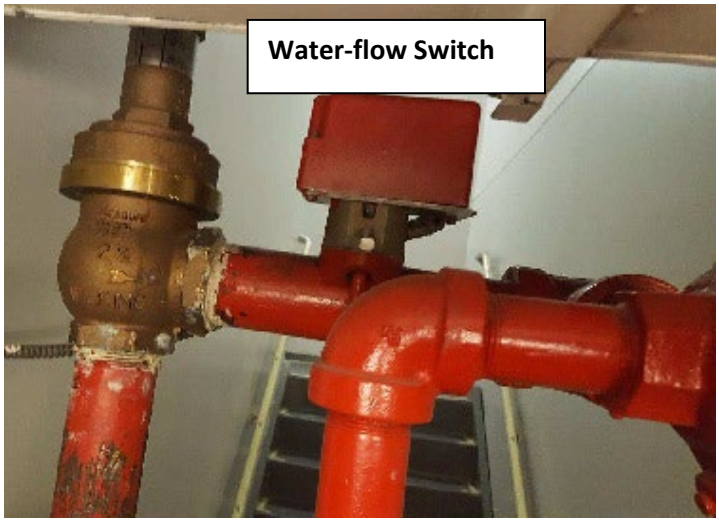
The fixed-temperature heat detectors are most commonly used. The detectors consist of two electrical contacts housed in a protective unit. The contacts are separated by a fusible element. The element melts when the temperature in the room reaches a preset level. This allows the contacts to touch. When the contacts meet the detector activates the fire alarm.

Fixed-temperature heat detectors

Where subject to mechanical damage a heat detector shall be protected by an approved UL/FM mechanical guard as shown in the picture below.

Heat detector with protective mechanical guard

6.4 SPRINKLER WATERFLOW ALARM-INITIATING DEVICES



The waterflow alarm initiating devices are used to detect the flow of water in a fire sprinkler system and to send an alarm signal. If the water starts to flow in the system, the vane or paddle triggers a switch sending a signal to the Fire Alarm Control Panel and activate bell. This device does not turn on or off the water. The activation of these devices will cause the fire alarm system to sound, recall the elevators and will send the fire alarm signal to the central station if the fire alarm system is monitored.

6.5 CARBON MONOXIDE DETECTORS

Carbon monoxide detectors are required in any building that has fossil (gas and oil) fuel burning equipment.

Carbon monoxide detector

A carbon monoxide detector is a device indicating a concentration of carbon monoxide at or above the alarm threshold that could pose a risk to the life safety of the occupants and that requires immediate action. Carbon monoxide detectors shall be installed, tested, and maintained by qualified personnel in accordance with the manufacturers published instructions.

If a carbon monoxide detector is in alarm condition and cannot be reset, this could indicate that carbon monoxide is still in the premises. Until such time that carbon monoxide can be excluded as the source of the alarm, the assumption should be that carbon monoxide is present and appropriate life safety precautions should be followed.

According to NYC Fire Code, a non-functioning device which has the physical appearance of fire protection equipment (such as a smoke detector camera or camera in an exit sign), but does not perform the fire protection function is never permitted. It is unlawful to install or maintain any fire protection device which does not perform the fire protection function.

6.6 MANUALLY ACTUATED ALARM-INITIATING DEVICES

Fire alarm systems that are manually activated use fire alarm pull stations. Manual fire alarm boxes (also referred to as pull stations alarm) shall be located near the exits throughout the protected area so that they are conspicuous, unobstructed, and accessible.

They must be located on each floor of a building.

Manual fire alarm boxes

The alarm stations used to activate the fire alarm system are called initiating devices. Once a manual pull station is activated, that device must be reset prior to resetting at the main Fire Alarm Control Panel (FACP). **The fire alarm control panel shall only be reset at the direction of a Fire Department representative**.

- **<u>Single action stations</u>** require only one step to activate the alarm. For example, the alarm might be activated by pulling down on a lever. An example of a single action station is shown on the next page. This kind of alarm station is often found indoors, e.g., in office buildings.

The cover on these alarm stations serves as a lever. When the cover is pulled down, it allows a switch inside to close. This sends the alarm signal.

Single action stations

- **<u>Double action stations</u>** require two steps in order to activate the alarm. The user must first break a glass, open a door or lift a cover. The user can then gain access to a switch or lever which must then be operated to initiate an alarm. To activate this type of alarm station the cover must be lifted before the

lever is pulled. This kind of double action station is often found indoors. Another kind of double action break glass station requires someone to break a small pane of glass with a small metal mallet.

Double action station

6.7 FLAMMABLE/COMBUSTIBLE GAS DETECTORS

Although it is not required by the FDNY, some flammable/combustible gas detectors (e.g. natural gas detector) may be connected to the Fire Alarm Control Panel. As an S-95 C of F holder, you must know if the flammable/combustible gas detectors on your premises are connected to a stand-alone monitor panel or the Fire Alarm Control Panel. If the detectors are connected to the Fire Alarm Control Panel, the activation will generate a supervisory signal on the Fire Alarm Control Panel and also be transmitted to the Central Station. Since it is not programed as a fire alarm signal, there is no alarm tone sounded on the premises to notify the public. However, the Central Station will still notify the premises owner and the Fire Department for flammable/combustible gas detectors' activation since flammable/combustible gas leakage may cause a fire, explosion or life-threatening condition. Flammable/combustible gas leak may be considered as a non-fire emergency incident, as an S-95 Certificate of Fitness holder, if you are aware of this incident, you will need to follow your building/occupancy specific non-fire emergency plans to perform the required actions before the FDNY arrives (see chapter 6 of this booklet for further information regarding non-fire emergencies). Once the FDNY firefighting personnel is dispatched to the premises to investigate the situation, the building staff and occupants must comply with the orders of FDNY firefighting personnel.

Example of a flammable/combustible gas detector

The Certificate of Fitness holder must know how to manually operate each alarm station on the premises. Once activated, the fire alarm system cannot be re-set at the fire alarm manual pull station. The alarm must be re-set at a main FACP after the pull station reset to its normal condition. The alarm may be turned off only by a Certificate of Fitness holder or by a Fire Department representative. Once activated, a key may be required to reset the manual pull station.

7. SPRINKLER SYSTEM

The installation, alteration, testing and repair of the sprinkler system, including any maintenance or modification of the system, shall be performed by a person possessing two licenses:

- Master Fire Suppression Piping Contractor license issued by the New York City Department of Buildings
- Certificate of Fitness for Citywide Sprinkler System (S-12/S-15) issued by FDNY and trained and knowledgeable in the installation, operation and maintenance of the specific system

The technician who is a Master Plumber and also holds the FDNY S-12/S-15 Certificate of Fitness is allowed to inspect, test, maintain and repair/replace the sprinkler system for the residential occupancies with 30 sprinkler heads or less without booster pump.

8. OTHER RELATED DEVICES

Supervisory devices are commonly installed as part of some protection systems. The supervisory devices monitor important parts of the system. A supervisory signal will audibly and visually annunciate at the FACP to indicate the supervisory condition which needs to be investigated and corrected. For example,

a signal will be sounded when a control valve is closed or in the wrong position. This type of signal is commonly called a supervisory signal. The signal is always transmitted to the main control panel. When a supervisory condition is indicated the Certificate of Fitness holder should check the system in order to identify the part of the system that caused the signal. Then that part of the system should be identified and dealt with accordingly. The supervisory signal may be transmitted to a FDNY approved central station company as well.

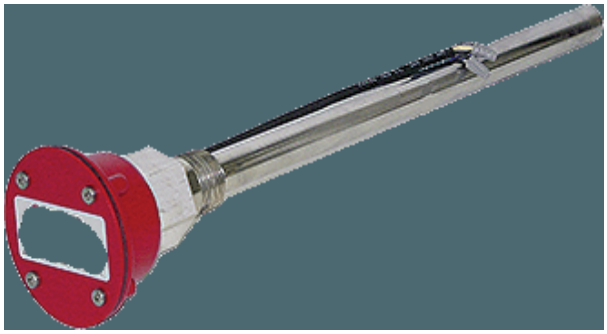
Some control panels indicate the exact location of the trouble. Other panels only display a general supervisory signal. For example, a lighted panel might indicate only that there is a problem somewhere in the fire protection system. Each supervised device must then be inspected to determine which part is causing the signal.

Common supervised conditions include:

1. Control valves- i.e. sprinkler system tamper switches (supervised for off-normal conditions).
2. Pressure valves-supervised for high and low pressure.
3. Water tanks-supervised for high/low water and temperature.
4. Electric fire pumps-supervised for pump running, pump failure, and phase reversal.

Pressure Supervisory Switch

Tank Water Level Supervisory Switch



Temperature Supervisory Switch

Tamper switch on a sprinkler valve

8.1 AUDIO AND VISUAL NOTIFICATION DEVICES

Notification appliances are used to alert persons of the need to take action, usually to evacuate. The appliances include bells, horns, speakers, strobes, text displays or a combination of these devices. The audible and/or visual notification alert the occupants of a fire or other emergency condition requiring action.

HORNS, HORN/STROBES

Speaker

Speaker strobe

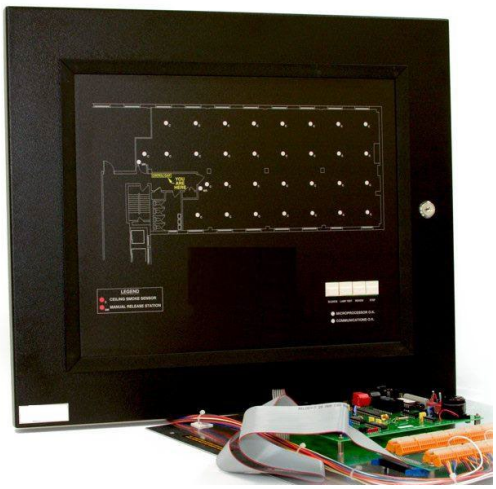
Horn Strobe

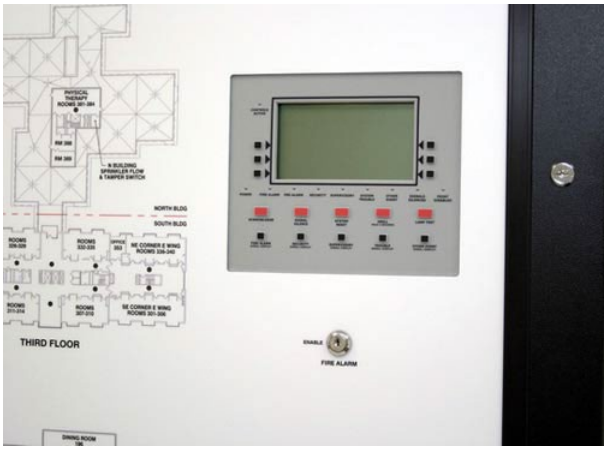
Strobe

Gongs Bells

8.2 REMOTE ON-SITE ANNUNCIATOR PANEL

In many buildings, a remote alarm annunciator panel is located where it is accessible to fire-fighting crews. The annunciator panel will indicate the zone and/or the location of the fire alarm device that has activated. In a large building such as an office tower or hotel, the fire annunciator may also be associated with a smoke purge control panel for building ventilation systems, and may also include emergency communication systems for the building.





Examples of Annunciator Panel

8.4 ACTIVATION OF AUDIO/VISUAL NOTIFICATION DEVICES

There are two methods used to notify the occupants of a building in case of a fire.

- The **first** method is the general alarm method. This method activates all audio/visual devices throughout the building when a fire is detected. **In certain locations, such as a day care center this may be the only feature available.**

- The **second** method is the selective method. The selective method activates the audio/visual devices only on the floor of alarm as well as the floor immediately above and the floor below.

After the fire alarm system for all methods has been activated it must be reset manually. When on the premises, the S-95 Certificate of Fitness holder shall investigate. The fire alarm system must be reset at the control panel. The fire alarm must remain in operating condition at all times.

9. COMMUNICATION SYSTEM

A functioning communication system is required as part of the fire alarm system when it is applicable. There are one and two-way communication system. The Certificate of Fitness holder must make sure that all communication units are working correctly.

- **One way** communication entails use of a public address system. Some buildings also have a public address system installed which is not part of the approved fire alarm system. Although not approved, the public address system may be used to warn and instruct building occupants in case of a fire emergency. All communication systems may be used to issue evacuation instructions in building requiring two way communications.
- **Two way** communication system uses warden phones. Warden phones must be placed at several locations in the building. The warden phones are usually located near exit stairways in the building. A warden phone must also be installed in the FACP. The FACP is used to issue instructions during a fire emergency. Portable two-way radios may also be used as a means of communication. Public systems may also be used to issue evaluation instructions in buildings.

Two-way communication systems must be tested at least annually according to NFPA 72, 2010. If a telephone system is used a signal should sound at the Fire Alarm Control Panel (FACP) as soon as the receiver is lifted from the cradle. **It should be noted that in some systems voice communication are not required.**

Central Station Transmitter

A central station transmitter is a device that receives alarm signals from protected premises and retransmits those signals to the Fire Department's Bureau of Fire Communication thru FDNY approved central station. The Central Station transmitter must have a primary and secondary means of communication.

The Certificate of Fitness holder must make sure that the central station transmitter is operable at all times. When transmitter malfunctions are discovered, the Certificate of Fitness holder must report the malfunctions to the FDNY approved central station company and record it in the log book. Authorized central station companies must be approved by FDNY. The central station company must arrange for any and all repairs as soon as possible.

S-95 Certificate of Fitness holders are **prohibited** from performing any repairs on the central station transmitter. They are also prohibited from installing or modifying any component of the fire alarm system.

10. TESTS, INSPECTIONS, AND REPAIR PROCEDURES FOR FIRE ALARM SYSTEMS

The S-95 Certificate of Fitness holder must supervise the operation and testing of the fire alarm system. A record of all tests, inspections, and other operations of the fire alarm system must be noted in the log book. Log books can be combined or separated depending upon your in house procedures.

If the system is not connected to a central station and meets the provision of NFPA 72 recommends a visual inspection to be performed semi-annually (as a minimum) on all "Initiating Devices". Testing of such devices shall be performed on annual basis.

The required visual inspections can be done by the S-95, F-53, F-89/T-89, and S-97 or S-98 Certificate of Fitness holders.

Only certified technicians holding S-97 or S-98 Certificate of Fitness are authorized to perform service and testing on the fire alarm systems.

Any testing requires entries to be entered into the logbook. Recording of entries must be performed by a person who physically performed the test or visual inspection. The S-95, F-53, F-89/T-89 and F-80 holders are authorized to maintain the log books.

10.1 INSPECTIONS

The fire alarm devices are highly recommended to be visually inspected for indicated abnormal conditions by the Certificate of Fitness holder at the beginning of each day. The purpose of the visual inspection is to detect defective components or abnormalities.

According to NFPA 72, the **visual inspection** of an/a:

- **UNMONITORED** Fire Command Center must be conducted by an S-95 C of F holder, a Fire and Life Safety Director, an F-80 C of F holder, an F-53 C of F holder, or an S-98 C of F holder at a minimum on a **weekly basis**.
- **MONITORED** Fire Command Center may be conducted by an S-95 C of F holder, a Fire and Life Safety Director, an F-80 C of F holder, an F-53 C of F holder, or an S-98 C of F holder **annually**.

*Although **daily visual inspection of the fire command center has been the industrial practice and highly recommended by the Fire Department**.

If an impairment is found, fire guard coverage may be required. See Certificate of Fitness category F-01 (Citywide Fire Guard for Impairment) that provides detailed information about the requirements and necessary actions for impairment.

10.2 ALARM LOG BOOK

The fire and life safety director, or in buildings not requiring a fire and life safety director, a person designated by the owner (such as an S-95 C of F holder) shall be responsible to make all log book entries required by the Fire Rule 907-01. Although an S-97/S-98 C of F holder may be allowed to make the entry when he/she services the fire alarm system; however, the Fire and Life Safety Director or the S-95 C of F holder is responsible to supervise the entries and the maintenance of the alarm log book. Any programing, servicing, testing, repairing and/or replacing the fire alarm system components shall be conducted only by an S-97/S-98 Certificate of Fitness holder.

(1) Location of the alarm log book

An alarm log book shall be maintained on the premises, at the building's main **fire alarm control panel**. In the absence of a secure location at the main fire alarm control panel, the alarm log book may be secured during non-business hours in another area provided it is made available for inspection by any FDNY representatives responding to an alarm on the premises.

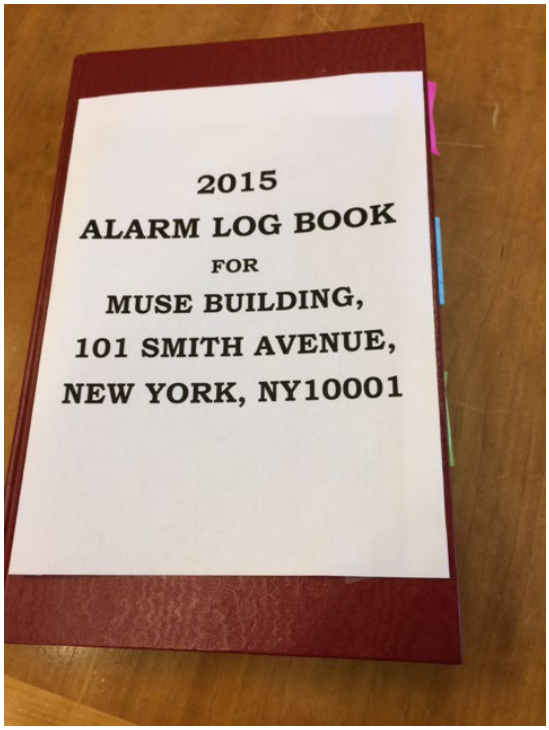
(2) Format of the alarm log book

<u>Information to be found at the beginning of the log book</u>:

- Premise's address
- Fire alarm system FDNY approval date – type of system/manufacturer
- FDNY approved central station information:
    1. account number
    2. company name
    3. telephone number
    4. supervisor's name
- Fire alarm maintenance contractor:
    1. company name
    2. telephone number
    3. supervisor's name

The alarm log book shall be a **bound book** (other than spiral bound) with consecutively numbered and lined pages. The cover of the log book shall bear the inscription, "ALARM LOG BOOK", together with the name and address of the building. All entries shall be made in ink and dated. A separate log book shall be kept for each calendar year. Log books shall be retained for a period of three (3) years from the date of the last entry.

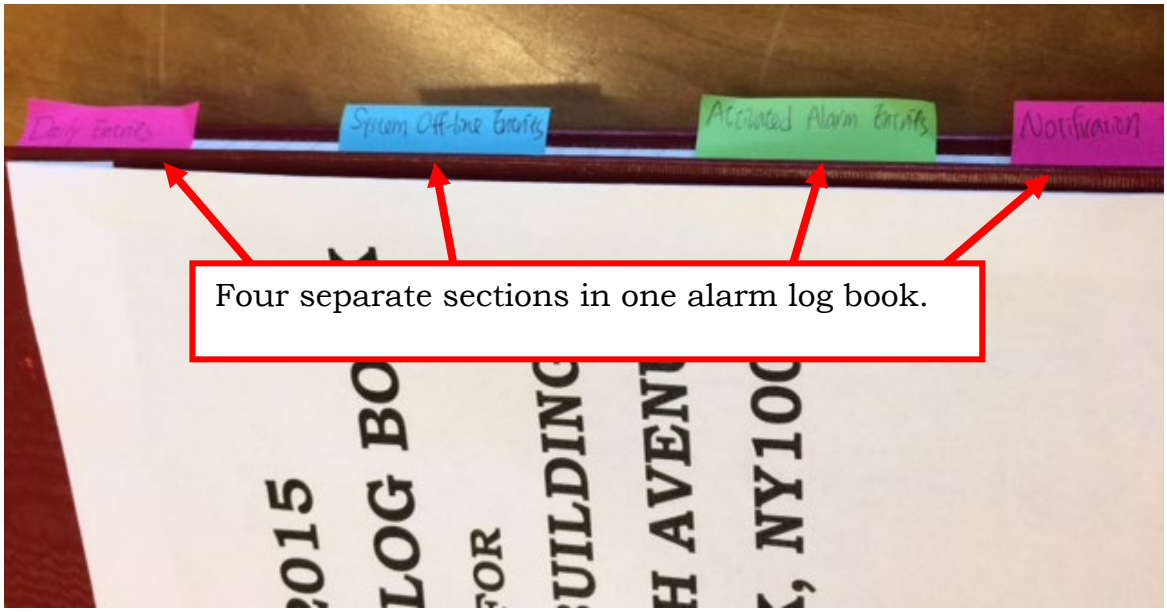
The FSP (fire safety and evacuation plan) log book is different from the alarm log book. It could be bounded with the fire alarm log book but must be properly labeled and divided.



(Example of an alarm log book)

(3) Alarm log book entries
Alarm log book entries shall be made in chronological order, recording the location and causes of all alarm signals transmitted by such fire alarm system. Building with fire and life safety directors shall also follow high rise bulleting guidelines.

The alarm log book shall be divided into 4 separate sections as set forth below. Each section shall have a sufficient number of pages to allow for entries for **at least one year**. The following log book entries are required and shall be made in each instance:



(A) Daily entries.
The name of the person who made the entry, the certificate of fitness number of the fire and life safety director on duty, if applicable, and the time each tour of duty began and ended, shall be entered in the alarm log book on a daily basis. These entries shall be set forth in columns in the log book as follows:

(*1*) Certificate Fitness holder's name
(*2*) Certificate of Fitness number
(*3*) time started
(*4*) time relieved

It should also include the actions taken if defective equipment or abnormal conditions witnessed

(B) System off-line entries.
The date and time the alarm system was taken off-line, the reason for such action, the name and Certificate of Fitness number of the person notified at the central station (or other evidence of notification satisfactory to the Fire Department), and the date and time the system was restored to service, shall be entered in the alarm log book in each such circumstance. These entries should be set forth in columns in the log book as follows:

(1) time off line
(2) reason off line
(3) central station name and telephone number
(4) central station operator's name and C of F number
(5) time restored
(6) name and C of F number of the C of F holder who made the entry

(C) Activated alarm entries.

The date and time the alarm activated, the type and location of the device (e.g., smoke detector, 27th floor, elevator lobby), the probable cause of the alarm, and the Fire Department unit and officer responding shall be entered in the alarm log book in each such circumstance. These entries should be set forth in columns in the log book as follows:

(1) date and time activated
(2) location and detector type
(3) probable cause
(4) Department unit and officer
(5) name and C of F number of the C of F holder who made the entry

It should also include the testing of manual station conducted by a S-97/S-98 Certificate of Fitness holder.

(D) Notification entries.

The date and time of any notification to the occupants of the premises regarding a non-functioning or improperly functioning alarm system. These entries should be set forth in columns in the log book as follows:

(1) date and time of notification made
(2) reason of notification
(3) action description
(4) name and C of F number of the C of F holder who made the entry
(5) memo for the follow up actions

SUGGESTED FORMAT FOR LOG BOOK ENTRY

(A) Daily Entries

Date	Time Started	Time Relieved	Name of COF holder	COF holder's COF number	Duty Description	Alarm Condition Description
1/06/15	1:00PM	1:30 PM	Joe Doe	89924922	Daily visual inspection	System is normal
1/07/15	2:00PM	2:45 PM	Jane Doe	89353423	Daily visual inspection	Discovered defective horn/strobe on 6th floor and notified ABC Fire alarm Co. for service call.

(B) System Off-line Entries

Date and Time Off Line	Reason Off Line	Central Station Name and phone number	Central Station Operator's Name	Central Station Operator's COF Number	Date and Time Restored	COF holder for record entry	COF holder's COF number
1/07/15 3:30pm	ABC Fire alarm Co. came to fix the defective horn/strobe on 6th floor.	OKK, 718-999-9999	Steve Doe	89924900	1/07/15 7:00pm	Jane Doe	89353423
1/21/15 7:30 am	testing of all pull stations on 5th floor	OKK, 718-999-9999	Jane Smith	99991111	1/21/15 7:45 am	Tom Doe	99346550
1/22/15 8:20 am	ABC Fire Alarm Co. fix the defective pull station on 5th floor	OKK, 718-999-9999	Jack Jones	22221234	1/22/15 10:00am	Tom Doe	99346550

(C)Activated alarm entries.

Date & time activated	Location & detector type	Probable cause	Responding Department Unit	Responding Department Officer	COF holder for record entry	COF holder's COF number
1/17/15 3:15 pm	Smoke detector of pantry room on 3rd floor	Smoke came from a microwave activated the smoke detector	Engine 10111	Chief. Smith	David Doe	89345678
1/21/15 7:30 am	All pull stations on 5th Floor	testing of post station	NA	NA	Tom Doe	99346550

(D) Notification entries.

Date & Time	Reason	Action	COF holder for record entry	COF holder's COF number	Follow Up Memo
1/21/15 8:30 am	A pull station in elevator lobby on 5th Floor found to be defective.	Place "out of service" sign over the pull station	Tom Doe	99346550	Repair made and sign removed. 1/22/15

10.3 MANUAL (PULL) STATIONS

FDNY recommends that each fire alarm system manual pull station be visually inspected at a minimum of once monthly where practical. The results of the test shall be recorded in the log book. Defective devices must be replaced immediately by qualified personnel. The manual stations may also be used to conduct fire drills. Based on the New York City Fire Code, manual fire alarm boxes must be red in color.

10.4 SMOKE DETECTORS

Smoke detectors must be:

(1) cleaned not less than once every six (6) months, except for analog (intelligent) smoke detectors, which shall be cleaned no later than one (1) week from receipt of an indication of the need for cleaning.
(2) tested for smoke entry not less than once a year.

This procedure ensures that the detector is kept in good working condition. Smoke detectors must be cleaned by a person holding a proper Certificate of Fitness for cleaning smoke detectors. The FDNY website provides a monthly list of approved Smoke Detector maintenance companies on the FDNY website @ **http://www1.nyc.gov/assets/fdny/downloads/pdf/business/approved-companies-smoke-detectors.pdf**

The S-95 Certificate of Fitness holders are not allowed to perform the smoke detector cleaning. The smoke detectors are extremely sensitive and easily damaged. They should never be painted or altered in any way. If the S-95 COF holder comes across a painted smoke detector, they should immediately make a log entry and arrange replacement of the device by a qualified technician. All testing shall be consistent with manufacturer specifications. Appliances shall be mounted independently of their attachments to the circuit conductors.

All maintenance and repairs of fire alarm systems and related components shall be performed by ***certified personnel*** in the inspection, testing, and maintenance of fire alarm systems as per NYC Building and Fire Codes.

10.5 CENTRAL STATION

The telephone number for the FDNY approved central station should be readily available to the S-95 Certificate of Fitness holder. The telephone number for the FDNY approved central station and the account number associated with the fire alarm system are required to be located on the FACP and central station transmitter.

10.6 FIRE ALARM SYSTEM OFF-LINE

Any time a fire alarm system is to be activated during a test, inspection, or fire drill, ***it is mandatory to take the system "off line" by notifying the FDNY approved central station company monitoring the fire alarm beforehand to prevent the unnecessary dispatching of the Fire Department***. It is not necessary to take the system offline when the speaker audibility tests are being conducted.

10.7 OUT-OF-SERVICE SITUATIONS & IMPAIRMENT COORDINATOR

An out of service system is a fire protection system that is not fully functional; or whose operation is impaired or not in good working order.

- **OUT OF SERVICE PROTOCOLS**

The owner or an owner's representative shall be notified when a fire alarm system or part of the system is impaired. System defects and malfunction shall be corrected. If a defect or malfunction is not corrected at the conclusion of a system inspection, testing, or maintenance, the system owner or the owner's representative shall be informed of the impairment immediately. The owner also shall be notified when an impairment period is completed or discontinued. Notification to the FDNY for a fire alarm system that is out-of-service must be reported promptly by the COF holder or Impairment Coordinator.

- **REQUIREMENTS FOR OUT OF SERVICE**

Where a required fire protection system is out of service, the Fire Department shall be notified immediately and unless otherwise directed by the Fire Commissioner, either the building shall be evacuated or a fire watch shall be maintained by one or more persons holding a Certificate of Fitness for Fire Guard. Any other actions as the Fire Commissioner may direct, in addition to or in lieu of such measures, shall also be undertaken, until the fire protection system has been returned to service. Where utilized, fire guards shall be provided with at least one approved means for notification to the Fire Department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

- **SYSTEM OFF-LINE ENTRIES**

The date and time the alarm system was taken off-line, the reason for such action, the name and operator number of the person notified at the FDNY approved central station (or other evidence of notification satisfactory to the Department), and the date and time the system was restored to service, shall be entered in the alarm log book in each such circumstance.

- **OUT OF SERVICE SIGNAGE**

A Certificate of Fitness holder must notify his/her supervisor and put a placard over the defective box indicating that device is out of service.

- **IMPAIRMENT COORDINATOR**

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

Fire protection systems include, but are not limited to, the Fire Command center and it's components, standpipe systems and sprinkler systems.

The owner/managing agent/tenant of the premises is required to designate an ***Impairment Coordinator*** for the building/entity. It will naturally be delegated to the Certificate of Fitness holder such as F-89/T-89 or S-95 and other related Certificate of Fitness categories, when present. However, when a Certificate of Fitness holder is not onsite the related responsibilities must be transferred to someone specified by the building owner/managing agent/tenant. It is important for the Impairment Coordinator to take immediate steps to notify the FDNY.

The New York City Fire Code requires that the Fire Department be notified of any fire protection system (including fire alarm) outage. The general information (non-emergency) numbers for the 5 boroughs that should be used for notifications from owners, building managers, impairment coordinators, etc. are as follows:

Manhattan	(212) 570-4300
Brooklyn	(718) 965-8300
Queens	(718) 476-6200
Bronx	(718) 430-0200
Staten Island	(718) 494-4296

THE NOTIFICATION SHALL INCLUDE:

1. brief description of the condition(s)
2. area affected
3. type of occupancy
4. estimated time until the fire protection system becomes operational
5. name and telephone number of Impairment Coordinator making the notification

Any impairment to a fire Alarm or related system poses safety risks to a building and its occupants. The impairment coordinator shall be responsible to ensure appropriate posting of a fire guard detail, notifications to tenants, and posting "out of service" signage when appropriate. In the absence of a specific designee, the owner shall be considered the Impairment Coordinator.

11. FIRE EXTINGUISHERS

Portable fire extinguishers are required by the Fire Code and Fire Rules. In certain occupancies and for certain activities to give the occupants the means to suppress a fire in its incipient stage. The capability for manual suppression can contribute to the protection of the occupants. To be effective, personnel must be properly trained in the use of portable fire extinguishers.

Portable fire extinguishers are required to be provided in the following locations:

- In all Group A, B, E, F, H, I, M, R-1, R-2 adult homes and enriched housing, and S occupancies.
- Within 30 feet of commercial cooking equipment.
- In areas where flammable or combustible liquids are manufactured, stored, handled and used in quantities requiring a permit.
- On each floor of structures under construction, alteration or demolition except detached Group R-3 occupancies.

NFPA Standard 10 requires that portable fire extinguishers be selected for the class(es) of fire hazards to be protected. The classification of portable fire extinguisher type corresponds with the classification of fires. NFPA Standard 10 classifies fires as follows:

- Class A fires are fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics.
- Class B fires are fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases.
- Class C fires are fires that involve energized electrical equipment.
- Class D fires are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, liquid, and potassium.
- Class K fires are fires in cooking appliances that involve combustible cooking media (vegetable or animal oils and fats.)

11.1 PORTABLE FIRE EXTINGUISHER TAGS

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

The color of the fire extinguishers may be changed by the FDNY every few years. The FDNY recommends two ways to verify the tag's legitimacy:

1. Hologram:

A real hologram strip shown on the tag is 3 inches long by ¼ inch wide. Counterfeit tags will NOT have a high quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

2. QR code

IF you scan the QR code, it should direct you to the updated FDNY approved fire extinguisher company list. You can use the company list to verify if the company printed on the list is currently approved by the FDNY.

If your PFE tags cannot be verified via these two methods, contact your supervisor. If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail: Tags.Decal@fdny.nyc.gov

PFE tag (This tag is released for 2021-2023)

11.2 PORTABLE FIRE EXTINGUISHER INSPECTIONS

MONTHLY

The portable fire extinguishers are required to be checked monthly. The owner of the business is responsible to select a person to do a monthly inspection. This monthly inspection is called a "quick check".

The **QUICK CHECK** should check if:
(1) the fire extinguisher is fully charged;
(2) it is in its designated place;
(3) it has not been actuated or tampered with;

(4) there is no obvious or physical damage or condition to prevent its operation.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check record must be kept on the back of the PFE tag or by an approved electronic method that provides a permanent record.

ANNUALLY

At least annually all Portable Fire Extinguishers must be checked by a W-96 Certificate of Fitness holder from FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

12. LITHIUM-ION BATTERY SAFETY

Lithium-ion safety

Lithium-ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones, and many other common household devices.

Lithium-ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging, and disposal for these types of batteries.

If you own a lithium-ion powered device or plan to buy one, the FDNY has important safety tips that you should follow. These tips apply to all devices powered by lithium-ion batteries, including phones, tablets, laptops, e-cigarettes, toys, high-tech luggage, and even robotic vacuum cleaners.

Immediately stop using or charging battery and call 911 if you notice:

- **Fire or Smoke**
- **Overheating**
- **Change in color or shape**
- **Odd noises**
- **Leaking**
- **Strange smell**

ALWAYS:

- purchase and use devices certified by a Nationally Recognized Testing Laboratory (NRTL).
- follow the manufacturer's instructions for:
  - charging and storage.
  - correct battery, cord, and power adapter
- keep exit path clear at all times.
- plug directly into a wall electrical outlet for charging.
- keep batteries and devices at room temperature.
- store and/or charge batteries away from anything flammable.
- keep away from heat sources.
- bring batteries to a **NYC Battery Recycling Center.** Visit nyc.gov/batteries for more information.

NEVER:

- use aftermarket batteries or chargers.
- use damaged or altered batteries
- plug into a power strip or overload an outlet.
- overcharge or leave battery charging overnight.
- charge a battery or device under your pillow, on your bed, or near a couch.
- leave e-bikes or e-scooters unattended while charging.
- block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
- place batteries in Trash or Recycling bin. **It is ILLEGAL.** Visit nyc.gov/batteries for disposal locations and information.

In the event of a Fire,
Leave and CLOSE the door.
Call 911 once you are in a safe location.

Charging Lithium Ion

Lithium-ion batteries do not have to be fully charged; partial charge is the most suitable.

When **charging more than five (5)** personal mobility devices or their removable batteries, it must be in a **dedicated room with ventilation** and a self-closing door.

For a total battery capacity of 20 kilowatt-hours (kWh), a 2-foot separation between charging batteries is required. For a total battery capacity up to 50 kWh, a 3-foot separation is needed.

Chargers must only be used with a compatible battery pack. The original equipment manufacturer (OEM) charger interplays with the battery pack using the battery management system (BMS). The wrong battery/charger combination may not work safely. For example, the 100% cutoff to prevent overcharging, which damages batteries, may not work which can easily create hazardous conditions such as fires, explosions and/or injuries.

Always check with the manufacturer or retailer of the personal mobility device, an authorized repair shop or a testing laboratory such as Underwrites Laboratories (UL) to see if replacement is recommended or listed and safe for use with that device. Using unauthorized parts, including batteries and/or chargers, may cause damage, fire and possibly void your warranty.

Extinguishing Lithium-ion

Water may not prevent a battery from burning and spreading. Battery cells are known to explode and quickly spread to another battery. It can spread to another devices.

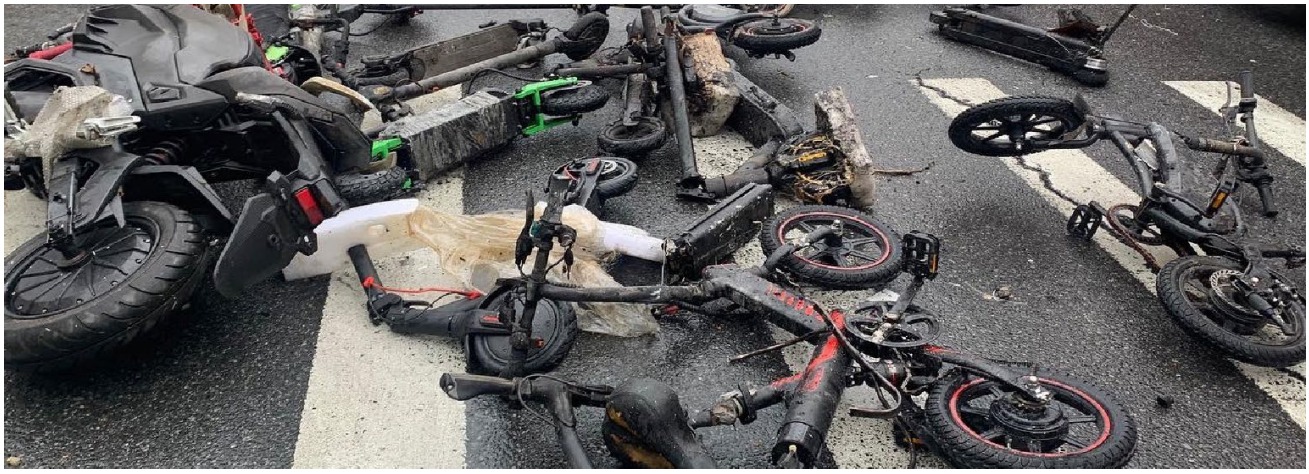
Fire Extinguishers
do not work
on lithium-ion batteries fires.

Unexpected Re-ignition.

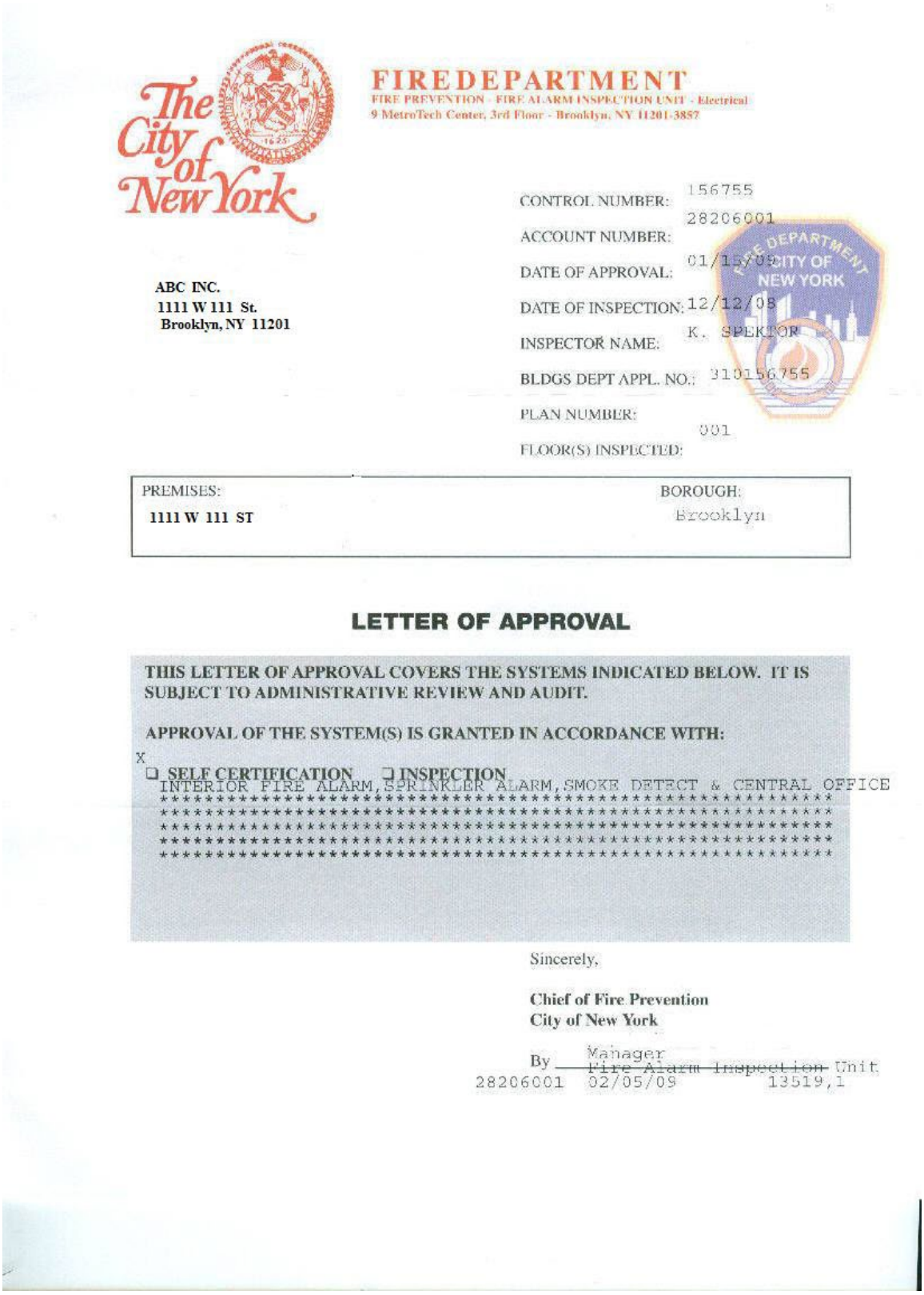
Reignition is common. Lithium-Ion Batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosion.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level fire may reignite on the battery and surrounding area.



APPENDIX A: SAMPLE OF THE "LETTER OF APPROVAL"



The City of New York

FIRE DEPARTMENT
FIRE PREVENTION - FIRE ALARM INSPECTION UNIT - Electrical
9 MetroTech Center, 3rd Floor - Brooklyn, NY 11201-3857

ABC INC.
1111 W 111 St.
Brooklyn, NY 11201

CONTROL NUMBER: 156755
ACCOUNT NUMBER: 28206001
DATE OF APPROVAL: 01/15/09
DATE OF INSPECTION: 12/12/08
INSPECTOR NAME: K. SPEKTOR
BLDGS DEPT APPL. NO.: 310156755
PLAN NUMBER:
FLOOR(S) INSPECTED: 001

FIRE DEPARTMENT CITY OF NEW YORK

PREMISES: 1111 W 111 ST
BOROUGH: Brooklyn

LETTER OF APPROVAL

THIS LETTER OF APPROVAL COVERS THE SYSTEMS INDICATED BELOW. IT IS SUBJECT TO ADMINISTRATIVE REVIEW AND AUDIT.

APPROVAL OF THE SYSTEM(S) IS GRANTED IN ACCORDANCE WITH:

X
❑ SELF CERTIFICATION ❑ INSPECTION
INTERIOR FIRE ALARM,SPRINKLER ALARM,SMOKE DETECT & CENTRAL OFFICE
****
****
****
****
****
****

Sincerely,

Chief of Fire Prevention
City of New York

By Manager ~~Fire Alarm Inspection~~ Unit

28206001 02/05/09 13519,1