A Four-Hour Advanced Internet Course on Chapter 9, Florida Building Code-Building, 5th Edition (2014)

Fire Protection Systems

with supplementary Information on
Chapter 471, F.S. The Engineer Registration Law and
Rules 61G15-19, 30 and 32, F.A.C.
The Rules of the Florida Board of Professional Engineers

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Four Hour Advanced Internet Course on

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Fire Protection Systems

Introduction

This four hour advanced internet based course on Chapter 9, Fire Protection Systems provides an in depth review of the General Regulations of the Florida Building Code for Fire Protection Systems for Florida Professional Engineers who specialize in the design of Fire Protection Systems under the code. The course emphasizes the design responsibilities of the Professional Engineer using the Code and evaluates the Professional Engineer's understanding of those responsibilities

Part I is Chapter 9 of The Florida Building Code-Building, 5th Edition (2014): Fire Protection Systems printed in full. Part II of the course provides information specific to the Florida Professional Engineer and their responsibilities under the Engineer Registration Law and the Rules of the Florida Board of Professional Engineers. Part III of the course is the course exam and is composed of 40 questions that will advance your current understanding of the code as it relates to the responsibilities of the Professional Engineer involved in the design of Fire Protection Systems under the code.

A score of 70% or greater is required in order to successfully complete the course. Students will have three opportunities to score the required 70%, however, should a 70% score not be achieved in three attempts course fees will be returned.

PART I

CHAPTER 9 FIRE PROTECTION SYSTEMS

SECTION 901 GENERAL
SECTION 902 DEFINITIONS
SECTION 903 AUTOMATIC SPRINKLER SYSTEMS
SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS
SECTION 905 STANDPIPE SYSTEMS
SECTION 906 PORTABLE FIRE EXTINGUISHERS
SECTION 907 FIRE ALARM AND DETECTION SYSTEMS
SECTION 908 EMERGENCY ALARM SYSTEMS
SECTION 909 SMOKE CONTROL SYSTEMS
SECTION 910 SMOKE AND HEAT REMOVAL
SECTION 911 FIRE COMMAND CENTER
SECTION 912 FIRE DEPARTMENT CONNECTIONS
SECTION 913 FIRE PUMPS
SECTION 914 EMERGENCY RESPONDER SAFETY FEATURES
SECTION 915 EMERGENCY RESPONDER RADIO COVERAGE

CHAPTER 9
FIRE PROTECTION SYSTEMS

SECTION 901
GENERAL

901.1 Scope.
The provisions of this chapter shall specify where *fire protection systems* are required and shall apply to the design, installation and operation of *fire protection systems* and carbon monoxide detection alarms.

901.2 Fire protection systems.
Fire protection systems shall be installed, repaired, operated and maintained in accordance with this code and the *Florida Fire Prevention Code*.

Any *fire protection system* for which an exception or reduction to the provisions of this code has been granted shall be considered to be a required system.

Exception: Any *fire protection system* or portion thereof not required by this code shall be permitted to be installed for partial or complete protection provided that such system meets the requirements of this code.

901.3 Modifications.
No person shall remove or modify any *fire protection system* installed or maintained under the provisions of this code or the *Florida Fire Prevention Code* without approval by the *building official*.

901.4 Threads.
Threads provided for fire department connections to sprinkler systems, standpipes, yard hydrants or any other fire hose connection shall be compatible with the connections used by the local fire department.

901.5 Acceptance tests.
Fire protection systems shall be tested in accordance with the requirements of this code and the *Florida Fire Prevention Code*. When required, the tests shall be conducted in the presence of the *building official*. Tests required by this code, the *Florida Fire Prevention Code* and the standards listed in this code shall be conducted at the expense of the owner or the owner's representative. It shall be unlawful to occupy portions of a structure until the required *fire protection systems* within that portion of the structure have been tested and *approved*.

901.6 Supervisory service.
Where required, *fire protection systems* shall be monitored by an approved supervising station in accordance with NFPA 72.

901.6.1 Automatic sprinkler systems.
Automatic sprinkler systems shall be monitored by an *approved* supervising station.

Exceptions:

1. A supervising station is not required for *automatic sprinkler systems* protecting one- and two-family dwellings.

2. Limited area systems serving fewer than 20 sprinklers.

901.6.2 Fire alarm systems.
Fire alarm systems required by the provisions of Section 907.2 of this code and the *Florida Fire Prevention Code* shall be monitored by an *approved* supervising station in accordance with Section 907.6.5.

Exceptions:

1. Single- and multiple-station smoke alarms required by Section 907.2.11.

2. Smoke detectors in Group I-3 occupancies.

3. Supervisory service is not required for *automatic sprinkler systems* in one- and two-family dwellings.

901.6.3 Group H.
Supervision and monitoring of emergency alarm, detection and automatic fire-extinguishing systems in Group H occupancies shall be in accordance with the *Florida Fire Prevention Code.*

901.7 Fire areas.
Where buildings, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, having a *fire-resistance rating* of not less than that determined in accordance with Section 707.3.10.

[F] 901.8 Pump and riser room size.
Fire pump and *automatic sprinkler system* riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working room around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and *automatic sprinkler system* riser rooms shall be provided with a door(s) and unobstructed passageway large enough to allow removal of the largest piece of equipment.

SECTION 902
DEFINITIONS

902.1 Definitions.
The following terms are defined in Chapter 2:

[F] ALARM NOTIFICATION APPLIANCE. A *fire alarm system* component such as a bell, horn, speaker, light or text display that provides audible, tactile or visible outputs, or any combination thereof.

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

[F] ALARM VERIFICATION FEATURE. A feature of *automatic* fire detection and alarm systems to reduce unwanted alarms wherein *smoke detectors* report alarm conditions for a minimum period of time, or confirm alarm conditions within a given time period, after being *automatically* reset, in order to be accepted as a valid alarm-initiation signal

[F] 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.

[F] AUDIBLE ALARM NOTIFICATION APPLIANCE.
A notification appliance that alerts by the sense of hearing.

[F] AUTOMATIC.
As applied to fire protection devices, a device or system providing an emergency function without the necessity for human intervention and activated as a result of a predetermined temperature rise, rate of temperature rise or combustion products.

[F] AUTOMATIC FIRE-EXTINGUISHING SYSTEM.
An *approved* system of devices and equipment which *automatically* detects a fire and discharges an *approved* fire-extinguishing agent onto or in the area of a fire.

[F] AUTOMATIC SMOKE DETECTION SYSTEM.
A fire alarm system that has initiation devices that utilize *smoke detectors* for protection of an area such as a room or space with detectors to provide early warning of fire.

[F] AUTOMATIC SPRINKLER SYSTEM.
An automatic sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply. The portion of the system above the ground is a network of specially sized or hydraulically designed piping installed in a structure or area, generally overhead, and to which *automatic* sprinklers are connected in a systematic pattern. The system is usually activated by heat from a fire and discharges water over the fire area

[F] AVERAGE AMBIENT SOUND LEVEL.
The root mean square, A-weighted sound pressure level measured over a 24-hour period, or the time any person is present, whichever time period is less.

[F] CARBON DIOXIDE EXTINGUISHING SYSTEMS.
A system supplying carbon dioxide (CO2) from a pressurized vessel through fixed pipes and nozzles. The system includes a manual- or *automatic*-actuating mechanism.

[F] CEILING LIMIT.
The maximum concentration of an air-borne contaminant to which one may be exposed. The ceiling limits utilized are those published in DOL 29 CFR Part 1910.1000. The ceiling Recommended Exposure Limit (REL-C) concentrations published by the U.S. National Institute for Occupational Safety and Health (NIOSH), Threshold Limit Value—Ceiling (TLV-C) concentrations published by the American Conference of Governmental Industrial Hygenists (ACGIH), Ceiling Work place Environmental Exposure Level (WEEL-Ceiling) Guides published by the American Industrial Hygiene Association (AIHA), and other *approved*, consistent measures are allowed as surrogates for hazardous substances not listed in DOL 29 CFR Part 1910.1000.

[F] CLEAN AGENT.
Electrically nonconducting, volatile or gaseous fire extinguishant that does not leave a residue upon vaporation.

[F] CONSTANTLY ATTENDED LOCATION.
A designated ocation at a facility staffed by trained personnel on a continuous basis where alarm or supervisory signals are monitored and facilities are provided for notification of the fire department or other emergency services.

[F] DELUGE SYSTEM.
A sprinkler system employing open sprinklers attached to a piping system connected to a water supply through a valve that is opened by the operation of a detection system installed in the same areas as the sprinklers. When this valve opens, water flows into the piping system and discharges from all sprinklers attached thereto.

[F] DETECTOR, HEAT.
A fire detector that senses heat—either abnormally high temperature or rate of rise, or both.

[F] DRY-CHEMICAL EXTINGUISHING AGENT.
A powder composed of small particles, usually of sodium bicarbonate, potassium bicarbonate, urea-potassium-based bicarbonate, potassium chloride or monoammonium phosphate, with added particulate material supplemented by special treatment to provide resistance to packing, resistance to moisture absorption (caking) and the proper flow capabilities.

[F] ELEVATOR GROUP.
A grouping of elevators in a *building* located adjacent or directly across from one another that responds to common hall call buttons.

[F] EMERGENCY ALARM SYSTEM.
A system to provide indication and warning of emergency situations involving *hazardous materials*.

[F] EMERGENCY VOICE/ALARM COMMUNICATIONS.
Dedicated manual or *automatic* facilities for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building.

[F] FIRE ALARM BOX, MANUAL.
See “Manual fire alarm box.”

[F] FIRE ALARM CONTROL UNIT.
A system component that receives inputs from *automatic* and manual *fire alarm* devices and may be capable of supplying power to detection devices and transponders or off-premises transmitters. The control unit may be capable of providing a transfer of power to the notification appliances and transfer of condition to relays or devices.

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

[F] FIRE ALARM SYSTEM.
A system or portion of a combination system consisting of components and circuits arranged to monitor and annunciate the status of *fire alarm* or *supervisory signal-initiating device*s and to initiate the appropriate response to those signals.

FIRE AREA.
The aggregate floor area enclosed and bounded by fire walls, *fire barriers*, *exterior walls* or *horizontal assemblies* of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above

[F] FIRE COMMAND CENTER.
The principal attended or unattended location where the status of detection, alarm communications and control systems is displayed, and from which the systems can be manually controlled.

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

[F] 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.

[F] FIRE SAFETY FUNCTIONS.
Building and fire control functions that are intended to increase the level of life safety for occupants or to control the spread of harmful effects of fire.

[F] FOAM-EXTINGUISHING SYSTEM.
A special system discharging a foam made from concentrates, either mechanically or chemically, over the area to be protected.

[F] HALOGENATED EXTINGUISHING SYSTEM.
A fire-extinguishing system using one or more atoms of an element from the halogen chemical series: fluorine, chlorine, bromine and iodine.

[F] 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.

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

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

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

[F] NOTIFICATION ZONE.
See “Zone, notification.”

[F] NUISANCE ALARM.
An alarm caused by mechanical failure, malfunction, improper installation or lack of proper maintenance, or an alarm activated by a cause that cannot be determined.

[F] RECORD DRAWINGS.
Drawings (“as builts”) that document the location of all devices, appliances, wiring sequences, wiring methods and connections of the components of a *fire alarm system* as installed.

[F] 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

[F] SMOKE ALARM.
A single- or multiple-station alarm responsive to smoke. See also definitions of “Multiple-station smoke alarm” and “Single station smoke alarm.”

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

[F] SMOKEPROOF ENCLOSURE.
An *exit stairway* designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

[F] STANDPIPE SYSTEM, CLASSES OF.
Standpipe classes are as follows

Class I system.
A system providing 21/2-inch (64 mm) hose connections to supply water for use by fire departments and those trained in handling heavy fire streams.

Class II system.
A system providing 1$_1$/$_2$-inch (38 mm) hose stations to supply water for use primarily by the building occupants or by the fire department during initial reponse

Class III system.
A system providing 1$_1$/$_2$-inch (38 mm) hose stations to supply water for use by building occupants and 2$_1$/$_2$-inch (64 mm) hose connections to supply a larger volume of water for use by fire departments and those trained in handling heavy fire streams

[F] STANDPIPE, TYPES OF.
Standpipe types are as follows

Automatic dry.
A dry standpipe system, normally filled with pressurized air, that is arranged through the use of a device, such as dry pipe valve, to admit water into the system piping *automatically* upon the opening of a hose valve. The water supply for an *automatic* dry standpipe system shall be capable of supplying the system demand.

Automatic wet.
A wet standpipe system that has a water supply that is capable of supplying the system demand *automatically.*

Manual dry.
A dry standpipe system that does not have a permanent water supply attached to the system Manual dry standpipe systems require water from a fire department pumper to be pumped into the system through the fire department connection in order to meet the system demand.

Manual wet.
A wet standpipe system connected to a water supply for the purpose of maintaining water within the system but does not have a water supply capable of delivering the system demand attached to the system. Manual wet standpipe systems require water from a fire department pumper (or the like) to be pumped into the system in order to meet the system demand

Semiautomatic dry.
A dry standpipe system that is arranged through the use of a device, such as a deluge valve, to admit water into the system piping upon activation of a remote control device located at a hose connection. A remote control at each hose connection. The water supply for a semiautomatic dry standpipe system shall be capable of supplying the system demand.

[F] SUPERVISING STATION.
A facility that receives signals and at which personnel are in attendance at all times to respond to these signals.

[F] SUPERVISORY SERVICE.
The service required to monitor performance of guard tours and the operative condition of fixed suppression systems or other systems for the protection of life and property.

[F] SUPERVISORY SIGNAL.
A signal indicating the need of action in connection with the supervision of guard tours, the fire suppression systems or equipment or the maintenance features of related systems.

[F] SUPERVISORY SIGNAL-INITIATING DEVICE.
An initiation device, such as a valve supervisory switch, water-level indicator or low-air pressure switch on a dry-pipe sprinkler system, whose change of state signals an off-normal condition and its restoration to normal of a fire protection or life safety system, or a need for action in connection with guard tours, fire suppression systems or equipment or maintenance features of related system

[F] TIRES, BULK STORAGE OF
Storage of tires where the area available for storage exceeds 20,000 cubic feet (566 m3).

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

[F] VISIBLE ALARM NOTIFICATION APPLIANCE.
A notification appliance that alerts by the sense of sight.

[F] WET-CHEMICAL EXTINGUISHING SYSTEM.
A solution of water and potassium-carbonate-based chemical, potassium-acetate-based chemical or a combination thereof, forming an extinguishing agent

[F] WIRELESS PROTECTION SYSTEM.
A system or a part of a system that can transmit and receive signals without the aid of wire.

[F] ZONE.
A defined area within the protected premises. A zone can define an area from which a signal can be received, an area to which a signal can be sent or an area in which a form of control can be executed.

[F] ZONE, NOTIFICATION.
An area within a building or facility covered by notification appliances which are activated simultaneously.

SECTION 903
AUTOMATIC SPRINKLER SYSTEMS

[F] 903.1 General.
Automatic sprinkler systems shall comply with this section.

[F] 903.1.1 Alternative protection.
Alternative automatic fire-extinguishing systems complying with Section 904 shall be permitted in lieu of automatic sprinkler protection where recognized by the applicable standard and *approved* by the fire code official.

[F] 903.2 Where required.
Approved *automatic sprinkler systems* in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

[F] 903.2.1 Group A.
An *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the *automatic sprinkler system* shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors from the Group A occupancy to, and including, the nearest *level of exit discharge* serving the Group A occupancy. For Group A-5 occupancies, the *automatic sprinkler system* shall be provided in the spaces indicated in Section 903.2.1.5.

[F] 903.2.1.1 Group A-1.
An *automatic sprinkler system* shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2);
2. The *fire area* has an *occupant load* of 300 or more;
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies; or
4. The *fire area* contains a multitheater complex.

[F] 903.2.1.2 Group A-2.
An *automatic sprinkler system* shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 5,000 square feet (464.5 m^2);
2. The *fire area* has an *occupant load* of 100 or more; or
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.3 Group A-3.
An *automatic sprinkler system* shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m^2);
2. The *fire area* has an *occupant load* of 300 or more; or
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.4 Group A-4.
An *automatic sprinkler system* shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2);
2. The *fire area* has an *occupant load* of 300 or more; or
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

[F] 903.2.1.5 Group A-5.
An *automatic sprinkler system* shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas in excess of 1,000 square feet (93 m^2).

[F] 903.2.2 Ambulatory care facilities.
An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation, whether rendered incapable by staff or staff has accepted responsibility for care recipients already incapable.
2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor where

such care is provided as well as all floors below, and all floors between the level of ambulatory care and the nearest level of exit discharge, including the level of exit discharge.

[F] 903.2.3 Group E.
An *automatic sprinkler system* shall be provided for Group E occupancies as follows:

1. Throughout all Group E *fire areas* greater than 12,000 square feet (1115 m^2) in area.

2. Throughout every portion of educational buildings below the lowest *level of exit discharge* serving that portion of the building.

   Exception: An *automatic sprinkler system* is not required in existing educational buildings unless 50 percent of the aggregate area of the building is being remodeled.

[F] 903.2.4 Group F-1.
An *automatic sprinkler system* shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 *fire area* exceeds 12,000 square feet (1115 m^2).

2. A Group F-1 *fire area* is located more than three stories above *grade plane*.

3. The combined area of all Group F-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).

4. A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

[F] 903.2.4.1 Woodworking operations.
An *automatic sprinkler system* shall be provided throughout all Group F-1 occupancy *fire areas* that contain woodworking operations in excess of 2,500 square feet (232 m^2) in area which generate finely divided combustible waste or use finely divided combustible materials.

[F] 903.2.5 Group H.
Automatic sprinkler systems shall be provided in high-hazard occupancies as required in Sections 903.2.5.1 through 903.2.5.3.

[F] 903.2.5.1 General.
An *automatic sprinkler system* shall be installed in Group H occupancies.

[F] 903.2.5.2 Group H-5.
An *automatic sprinkler system* shall be installed throughout buildings containing Group H-5 occupancies. The design of the sprinkler system shall not be less than that required by this code for the occupancy hazard classifications in accordance with Table 903.2.5.2. Where the design area of the sprinkler system consists of a *corridor* protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

[F] TABLE 903.2.5.2
GROUP H-5 SPRINKLER DESIGN CRITERIA

LOCATION	OCCUPANCY HAZARD CLASSIFICATION
Fabrication areas	Ordinary Hazard Group 2
Service corridors	Ordinary Hazard Group 2
Storage rooms without dispensing	Ordinary Hazard Group 2
Storage rooms with dispensing	Extra Hazard Group 2
Corridors	Ordinary Hazard Group 2

[F] 903.2.5.3 Pyroxylin plastics.
An *automatic sprinkler system* shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds (45 kg).

[F] 903.2.6 Group I.
An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exceptions:

1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted
in Group I-1 facilities.

2. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be allowed in Group I-1 facilities when in compliance with all of the following:

    2.1. A hydraulic design information sign is located on the system riser;

    2.2. Exception 1 of Section 903.4 is not applied; and

    2.3. Systems shall be maintained in accordance with the requirements of Section 903.3.1.2.

3. An *automatic sprinkler system* is not required where day care facilities are at the *level of exit discharge* and where every room where care is provided has at least one exterior exit door.

4. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided and all floors between the level of care and the level of *exit discharge*, all floors below the *level of exit discharge*, other than areas classified as an open parking garage.

[F] 903.2.7 Group M.
An *automatic sprinkler system* shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group M *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group M *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m^2).

[F] 903.2.7.1 High-piled storage.
An *automatic sprinkler system* shall be provided in accordance with the *Florida Fire Prevention Code* in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

[F] 903.2.8 Group R.
An *automatic sprinkler system* installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R *fire area*.

[F] 903.2.8.1 Group R-3 or R-4 congregate residences.
An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be permitted in Group R-3 or R-4 congregate residences with 16 or fewer residents.

[F] 903.2.8.2 Care facilities. An automatic sprinkler
system installed in accordance with Section 903.3.1.3 shall be permitted in care facilities with 5 or fewer individuals in a single-family dwelling.

[F] 903.2.9 Group S-1.
An *automatic sprinkler system* shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 *fire area* used for the storage of commercial trucks or buses where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

[F] 903.2.9.1 Repair garages.
An *automatic sprinkler system* shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more *stories above grade plane*, including basements, with a *fire area* containing a repair garage exceeding 10,000 square feet (929 m^2).

2. Buildings no more than one *story above grade plane*, with a *fire area* containing a repair garage exceeding 12,000 square feet (1115 m^2).

3. Buildings with repair garages servicing vehicles parked in basements.

4. A Group S-1 *fire area* used for the repair of commercial trucks or buses where the *fire area* exceeds 5,000 square feet (464 m^2).

[F] 903.2.9.2 Bulk storage of tires.
Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet (566 m^3) shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

[F] 903.2.10 Group S-2 enclosed parking garages.
An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 as follows:

1. Where the *fire area* of the enclosed parking garage exceeds 12,000 square feet (1115 m^2); or

2. Where the enclosed parking garage is located beneath other groups.

   Exception: Enclosed parking garages located beneath Group R-3 occupancies.

[F] 903.2.10.1 Commercial parking garages.
An *automatic sprinkler system* shall be provided throughout buildings used for storage of commercial trucks or buses where the *fire area* exceeds 5,000 square feet (464 m^2).

[F] 903.2.11 Specific building areas and hazards.
In all occupancies other than Group U, an *automatic sprinkler system* shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

[F] 903.2.11.1 Stories without openings.
An *automatic sprinkler system* shall be installed throughout all *stories*, including basements, of all buildings where the floor area exceeds 1,500 square feet (139.4 m^2) and where there is not provided at least one of the following types of *exterior wall* openings:

1. Openings below grade that lead directly to ground level by an exterior *stairway* complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the *story* on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).

2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m^2) in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm). The height of the bottom of the clear opening shall not exceed 44 inches (1118 mm) measured from the floor.

[F] 903.2.11.1.1 Opening dimensions and access.
Openings shall have a minimum dimension of not less than 30 inches (762 mm). Such openings shall be accessible to the fire department from the exterior and shall not be obstructed in a manner that fire fighting or rescue cannot be accomplished from the exterior.

[F] 903.2.11.1.2 Openings on one side only.
Where openings in a *story* are provided on only one side and the opposite wall of such *story* is more than 75 feet (22 860 mm) from such openings, the *story* shall be equipped throughout with an *approved automatic sprinkler system*, or openings as specified above shall be provided on at least two sides of the *story*.

[F] 903.2.11.1.3 Basements.
Where any portion of a *basement* is located more than 75 feet (22 860 mm) from openings required by Section 903.2.11.1, or where walls, partitions or other obstructions are installed that restrict the application of water from hose streams, the *basement* shall be equipped throughout with an *approved automatic sprinkler system*.

[F] 903.2.11.2 Rubbish and linen chutes.
An *automatic sprinkler system* shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes shall have additional sprinkler heads installed at alternate floors and at the lowest intake. Where a rubbish chute extends through a building more than one floor below the lowest intake, the extension shall have sprinklers installed that are recessed from the drop area of the chute and protected from freezing in accordance with Section 903.3.1.1. Such sprinklers shall be installed at alternate floors, beginning with the second level below the last intake and ending with the floor above the discharge. Chute sprinklers shall be accessible for servicing.

[F] 903.2.11.3 Buildings three stories or more in height.
Any building which is of three stories or more in height shall be equipped with an approved automatic sprinkler system installed in accordance with Section 903.1.

Exceptions:

1. Single- and two-family dwellings.

2. A stand-alone parking garage constructed with noncombustible materials, the design of which is such that all levels of the garage are uniformly open to the atmosphere on all sides with the percentages of openings equal to or greater than those specified in Section 406.3. Such garages shall be separated from any other structure by not less than 20 feet (6096 mm). A stand-alone parking garage is one that is solely for the parking of vehicles and does not have any other occupancy group in the building.

3. Telecommunication spaces located within telecommunication buildings, if the spaces are equipped to meet an equivalent fire prevention standard approved by both the Florida Building Commission and the State Fire Marshal.

4. Telecommunications spaces within telecommunication buildings, if the telecommunications space is equipped with:

    4.1. Air sampling smoke detection.

    4.2. Remote, proprietary or central station fire alarm monitoring.

    4.3. Automatic smoke exhaust system.

    4.4. One-hour fire-resistance wall separating the telecommunications space from the adjacent areas on the same floor.

    4.5. Two-hour floor/ceiling assembly separating the telecommunications space from adjacent floors.

    4.6. All other portions ancillary to the telecommunications equipment area shall be provided with fire sprinkler protection.

5. Sprinkler systems installed solely as a requirement of Section 903.2.11.3 may be a NFPA 13R or NFPA 13D system in accordance with their scopes.

903.2.11.3.1
NFPA 101 as adopted by *Florida Fire Prevention Code*, as regarding the requirements for fire protection sprinklers, is applicable to all multiple-family residential buildings, whether designated as townhouses, condominiums, apartment houses, tenements, garden apartments or by any other name. The attorney general has determined that for the purpose of the fire protection sprinkler requirements in Section 553.895(2), *Florida Statutes*, townhouses that are three or more stories tall and consist of three or more units together are multiple-family dwellings. Therefore, these types of townhouses are not exempt from being considered for the requirements to provide fire protection sprinklers (even if there are any other definitions that define a townhouse as a single-family residence). When determining whether townhouses require fire protection sprinkler systems, the building official must consider in parallel: (a) the attorney general's opinion defining the statutory language for townhouses; (b) the building code requirements, including all life-safety chapters, that provide additional determining criteria, such as construction types, fire resistance, fire protection systems and egress; and (c) the NFPA 101 as adopted by

Florida Fire Prevention Code, egress and protection determining criteria. The more restrictive criteria are then applied.

[F] 903.2.11.4 Ducts conveying hazardous exhausts.
Where required by the *Florida Building Code, Mechanical*, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, or flammable or combustible materials.

Exception: Ducts in which the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).

[F] 903.2.11.5 Commercial cooking operations.
An *automatic sprinkler system* shall be installed in commercial kitchen exhaust hood and duct system where an *automatic sprinkler system* is used to comply with Section 904.

[F] 903.2.11.6 Other required suppression systems.
In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.11.6 also require the installation of a fire suppression system for certain buildings and areas.

[F] TABLE 903.2.11.6
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS

SECTION	SUBJECT
402.10	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.6	Group I-2
410.7	Stages
411.4	Special amusement buildings
412.4.6, 412.4.6.1, 412.6.5	Aircraft hangars
415.10.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
507	Unlimited area buildings
509.4	Incidental uses
1028.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in the *Florida Fire Prevention Code*

[F] 903.2.12 During construction.
Automatic sprinkler systems required during construction, *alteration* and demolition operations shall be provided in the *Florida Fire Prevention Code.*

[F] 903.3 Installation requirements.
Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.6.

[F] 903.3.1 Standards.
Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1 unless otherwise permitted by Sections 903.3.1.2 and 903.3.1.3 and other chapters of this code, as applicable.

[F] 903.3.1.1 NFPA 13 sprinkler systems.
Where the provisions of this code require that a building or portion thereof be equipped throughout with an *automatic sprinkler system* in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.

[F] 903.3.1.1.1 Exempt locations.
Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an *approved* automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance-rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.

2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when *approved* by the fire code official.

3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.

4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.

5. Fire service access elevator machine rooms and machinery spaces.

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

[F] 903.3.1.2 NFPA 13R sprinkler systems.
Automatic sprinkler systems in Group R occupancies up to and including four stories in height shall be permitted to be installed throughout in accordance with NFPA 13R.

[F] 903.3.1.2.1 Balconies and decks.
Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

[F] 903.3.1.3 NFPA 13D sprinkler systems.
Automatic sprinkler systems installed in one- and two-family *dwellings,* Group R-3 and R-4 congregate residences and *townhouses* shall be permitted to be installed throughout in accordance with NFPA 13D.

[F] 903.3.2 Quick-response and residential sprinklers.
Where *automatic sprinkler systems* are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing care recipient *sleeping units* in Group I-2 in accordance with this code.

2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.

3. *Dwelling units* and *sleeping units* in Group I-1 and R occupancies.

4. Light-hazard occupancies as defined in NFPA 13.

[F] 903.3.3 Obstructed locations.
Automatic sprinklers shall be installed with due regard to obstructions that will delay activation or obstruct the water distribution pattern. Automatic sprinklers shall be installed in or under covered kiosks, displays, booths, concession stands, or equipment that exceeds 4 feet (1219 mm) in width. Not less than a 3-foot (914 mm) clearance shall be maintained between automatic sprinklers and the top of piles of combustible fibers.

Exception: Kitchen equipment under exhaust hoods protected with a fire-extinguishing system in accordance with Section 904.

[F] 903.3.4 Actuation.
Automatic sprinkler systems shall be automatically actuated unless specifically provided for in this code.

[F] 903.3.5 Water supplies.
Water supplies for *automatic sprinkler systems* shall comply with this section and the standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with the requirements of this section and the *Florida Building Code, Plumbing.*

[F] 903.3.5.1 Domestic services.
Where the domestic service provides the water supply for the *automatic sprinkler system*, the supply shall be in accordance with this section.

[F] 903.3.5.1.1 Limited area sprinkler systems.
Limited area sprinkler systems serving fewer than 20 sprinklers on any single connection are permitted to be connected to the domestic service where a wet automatic standpipe is not available. Limited area sprinkler systems connected to domestic water supplies shall comply with each of the following requirements:

1. Valves shall not be installed between the domestic water riser control valve and the sprinklers.

   Exception: An *approved* indicating control valve supervised in the open position in accordance with Section 903.4.

2. The domestic service shall be capable of supplying the simultaneous domestic demand and the sprinkler demand required to be hydraulically calculated by NFPA 13, NFPA 13D or NFPA 13R.

[F] 903.3.5.1.2 Residential combination services.
A single combination water supply shall be allowed provided that the domestic demand is added to the sprinkler demand as required by NFPA 13R.

[F] 903.3.5.2 Secondary water supply.
An automatic secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by the *Florida Building Code, Building*. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

[F] 903.3.6 Hose threads.
Fire hose threads and fittings used in connection with *automatic sprinkler systems* shall be as prescribed by the fire code official.

[F] 903.4 Sprinkler system supervision and alarms.
All valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.

2. Limited area systems serving fewer than 20 sprinklers.

3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.

4. Jockey pump control valves that are sealed or locked in the open position.

5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.

6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.

7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

[F] 903.4.1 Monitoring.
Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an *approved* supervising station or, when *approved* by the fire code official, shall sound an audible signal at a *constantly attended location*.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.

2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

[F] 903.4.2 Alarms.
An approved audible device, located on the exterior of the building in an approved location, shall be connected to each *automatic sprinkler system*. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

[F] 903.4.3 Floor control valves.
Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings.

[F] 903.5 Testing and maintenance.
Sprinkler systems shall be tested and maintained in accordance with the *Florida Fire Prevention Code.*

SECTION 904
ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

[F] 904.1 General.
Automatic fire-extinguishing systems, other than *automatic sprinkler systems*, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

[F] 904.2 Where required.
Automatic fire-extinguishing systems installed as an alternative to the required *automatic sprinkler systems* of Section 903 shall be *approved* by the fire code official. Automatic fire-

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

[F] 904.2.1 Commercial hood and duct systems.
Each required commercial kitchen exhaust hood and duct system required by the *Florida Fire Prevention Code* or Chapter 5 of the *Florida Building Code, Mechanical* to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

[F] 904.3 Installation.
Automatic fire-extinguishing systems shall be installed in accordance with this section.

[F] 904.3.1 Electrical wiring.
Electrical wiring shall be in accordance with NFPA 70.

[F] 904.3.2 Actuation.
Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.11.1. Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

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

[F] 904.3.3 System interlocking.
Automatic equipment interlocks with fuel shutoffs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

[F] 904.3.4 Alarms and warning signs.
Where alarms are required to indicate the operation of automatic fire-extinguishing systems, distinctive audible and visible alarms and warning signs shall be provided to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning signal shall be provided to alert occupants once agent discharge has begun. Audible signals shall be in accordance with Section 907.5.2.

[F] 904.3.5 Monitoring.
Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

[F] 904.4 Inspection and testing.
Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

[F] 904.4.1 Inspection.
Prior to conducting final acceptance tests, the following items shall be inspected:

1. Hazard specification for consistency with design hazard.

2. Type, location and spacing of automatic- and manual-initiating devices.

3. Size, placement and position of nozzles or discharge orifices.

4. Location and identification of audible and visible alarm devices.

5. Identification of devices with proper designations.

6. Operating instructions.

[F] 904.4.2 Alarm testing.
Notification appliances, connections to fire alarm systems and connections to *approved* supervising stations shall be tested in accordance with this section and Section 907 to verify proper operation.

[F] 904.4.2.1 Audible and visible signals.
The audibility and visibility of notification appliances signaling agent discharge or system operation, where required, shall be verified.

[F] 904.4.3 Monitor testing.
Connections to protected premises and supervising station fire alarm systems shall be tested to verify proper identification and retransmission of alarms from automatic fire-extinguishing systems.

[F] 904.5 Wet-chemical systems.
Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17A and their listing.

[F] 904.6 Dry-chemical systems.
Dry-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17 and their listing.

[F] 904.7 Foam systems.
Foam-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 11 and NFPA 16 and their listing.

[F] 904.8 Carbon dioxide systems.
Carbon dioxide extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12 and their listing.

[F] 904.9 Halon systems.
Halogenated extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 12A and their listing.

[F] 904.10 Clean-agent systems.
Clean-agent fire-extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 2001 and their listing.

[F] 904.11 Commercial cooking systems.
The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL 300 and *listed* and *labeled* for the intended application. Other types of automatic fire-extinguishing systems shall be *listed* and *labeled* for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer's installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.

2. *Automatic sprinkler systems*, NFPA 13.

3. Foam-water sprinkler system or foam-water spray systems, NFPA 16.

4. Dry-chemical extinguishing systems, NFPA 17.

5. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and *listed*, *labeled* and installed in accordance with Section 304.1 of the *Florida Building Code, Mechanical*.

[F] 904.11.1 Manual system operation.
A manual actuation device shall be located at or near a *means of egress* from the cooking area a minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) or less than 42 inches (1067 mm) above the floor and shall clearly identify the hazard protected. The manual actuation shall require a maximum force of 40 pounds (178 N) and a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: *Automatic sprinkler systems* shall not be required to be equipped with manual actuation means.

[F] 904.11.2 System interconnection.
The actuation of the fire suppression system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

[F] 904.11.3 Carbon dioxide systems.
When carbon dioxide systems are used, there shall be a nozzle at the top of the ventilating duct. Additional nozzles that are symmetrically arranged to give uniform distribution shall be installed within vertical ducts exceeding 20 feet (6096 mm) and horizontal ducts exceeding 50 feet (15 240 mm). *Dampers* shall be installed at either the top or the bottom of the duct and shall be arranged to operate automatically upon activation of the fire-extinguishing system. Where the *damper* is installed at the top of the duct, the top nozzle shall be immediately below the *damper*. Automatic carbon dioxide fire-extinguishing systems shall be

sufficiently sized to protect against all hazards venting through a common duct simultaneously.

[F] 904.11.3.1 Ventilation system.
Commercial-type cooking equipment protected by an automatic carbon dioxide-extinguishing system shall be arranged to shut off the ventilation system upon activation.

[F] 904.11.4 Special provisions for automatic sprinkler systems.
Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, readily accessible, indicating-type control valve that is identified.

[F] 904.11.4.1 Listed sprinklers.
Sprinklers used for the protection of fryers shall be tested in accordance with UL 199E, *listed* for that application and installed in accordance with their listing.

SECTION 905
STANDPIPE SYSTEMS

[F] 905.1 General.
Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire hose threads used in connection with standpipe systems shall be *approved* and shall be compatible with fire department hose threads. The location of fire department hose connections shall be *approved*. In buildings used for high-piled combustible storage, fire protection shall be in accordance with the *Florida Fire Prevention Code.*

[F] 905.2 Installation standard.
Standpipe systems shall be installed in accordance with this section and NFPA 14.

[F] 905.3 Required installations.
Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.8. Standpipe systems are allowed to be combined with *automatic sprinkler systems*.

Exception: Standpipe systems are not required in Group R-3 occupancies.

[F] 905.3.1 Height.
Class III standpipe systems shall be installed throughout buildings where the floor level of the highest *story* is located more than 30 feet (9144 mm) above the lowest level of fire department vehicle access, or where the floor level of the lowest *story* is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

2. Class I manual standpipes are allowed in *open parking garages* where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.

3. Class I manual dry standpipes are allowed in *open parking garages* that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.

4. Class I standpipes are allowed in basements equipped throughout with an *automatic sprinkler system*.

5. In determining the lowest level of fire department vehicle access, it shall not be required to consider:

    5.1. Recessed loading docks for four vehicles or less; and

    5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

[F] 905.3.2 Group A.
Class I automatic wet standpipes shall be provided in nonsprinklered Group A buildings having an *occupant load* exceeding 1,000 persons.

Exceptions:

1. Open-air-seating spaces without enclosed spaces.

2. Class I automatic dry and semiautomatic dry standpipes or manual wet standpipes are allowed in buildings that are not high-rise buildings.

[F] 905.3.3 Covered and open mall buildings.
Covered mall and open mall buildings shall be equipped throughout with a standpipe system where required by Section 905.3.1. Mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the *automatic sprinkler system* sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed to not exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each *exit* passageway or *corridor*.

2. At each floor-level landing within enclosed stairways opening directly on the mall.

3. At exterior public entrances to the mall of a covered mall building.

4. At public entrances at the perimeter line of an open mall building.

5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.

[F] 905.3.4 Stages.

Stages greater than 1,000 square feet in area (93 m^2) shall be equipped with a Class III wet standpipe system with $1^1/_2$-inch and $2^1/_2$-inch (38 mm and 64 mm) hose connections on each side of the stage.

Exception: Where the building or area is equipped throughout with an *automatic sprinkler system*, a $1^1/_2$-inch (38 mm) hose connection shall be installed in accordance with NFPA 13 or in accordance with NFPA 14 for Class II or III standpipes.

[F] 905.3.4.1 Hose and cabinet.

The $1^1/_2$-inch (38 mm) hose connections shall be equipped with sufficient lengths of $1^1/_2$-inch (38 mm) hose to provide fire protection for the stage area. Hose connections shall be equipped with an *approved* adjustable fog nozzle and be mounted in a cabinet or on a rack.

[F] 905.3.5 Underground buildings.

Underground buildings shall be equipped throughout with a Class I automatic wet or manual wet standpipe system.

[F] 905.3.6 Helistops and heliports.

Buildings with a rooftop *helistop* or *heliport* shall be equipped with a Class I or III standpipe system extended to the roof level on which the *helistop* or *heliport* is located in accordance with the *Florida Fire Prevention Code*.

[F] 905.3.7 Marinas and boatyards.

Standpipes in marinas and boatyards shall comply with the *Florida Fire Prevention Code.*

[F] 905.3.8 Rooftop gardens and landscaped roofs.

Buildings or structures that have rooftop gardens or landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the rooftop garden or landscaped roof is located.

[F] 905.4 Location of Class I standpipe hose connections.

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

1. In every required *stairway*, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise *approved* by the fire code official.

2. On each side of the wall adjacent to the *exit* opening of a *horizontal exit*.

   Exception: Where floor areas adjacent to a *horizontal exit* are reachable from *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the *horizontal exit*.

3. In every *exit* passageway, at the entrance from the *exit* passageway to other areas of a building.

   Exception: Where floor areas adjacent to an *exit* passageway are reachable from *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the *exit* passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.

5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.16.

6. Where the most remote portion of a nonsprinklered floor or *story* is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or *story* is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in *approved* locations.

[F] 905.4.1 Protection.
Risers and laterals of Class I standpipe systems not located within an enclosed *stairway* or pressurized enclosure shall be protected by a degree of *fire resistance* equal to that required for vertical enclosures in the building in which they are located.

Exception: In buildings equipped throughout with an *approved automatic sprinkler system*, laterals that are not located within an enclosed *stairway* or pressurized enclosure are not required to be enclosed within fire-resistance-rated construction.

[F] 905.4.2 Interconnection.
In buildings where more than one standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

[F] 905.5 Location of Class II standpipe hose connections.
Class II standpipe hose connections shall be accessible and located so that all portions of the building are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose.

[F] 905.5.1 Groups A-1 and A-2.
In Group A-1 and A-2 occupancies having *occupant loads* exceeding 1,000 persons, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, on each side of the balcony and on each tier of dressing rooms.

[F] 905.5.2 Protection.
Fire-resistance-rated protection of risers and laterals of Class II standpipe systems is not required.

[F] 905.5.3 Class II system 1-inch hose.
A minimum 1-inch (25 mm) hose shall be permitted to be used for hose stations in light-hazard occupancies where investigated and *listed* for this service and where *approved* by the fire code official.

[F] 905.6 Location of Class III standpipe hose connections.
Class III standpipe systems shall have hose connections located as required for Class I standpipes in Section 905.4 and shall have Class II hose connections as required in Section 905.5.

[F] 905.6.1 Protection.
Risers and laterals of Class III standpipe systems shall be protected as required for Class I systems in accordance with Section 905.4.1.

[F] 905.6.2 Interconnection.
In buildings where more than one Class III standpipe is provided, the standpipes shall be interconnected in accordance with NFPA 14.

[F] 905.7 Cabinets.
Cabinets containing fire-fighting equipment such as standpipes, fire hoses, fire extinguishers or fire department valves shall not be blocked from use or obscured from view.

[F] 905.7.1 Cabinet equipment identification.
Cabinets shall be identified in an *approved* manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein.

Exceptions:

1. Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein.

2. Doors that have either an *approved* visual identification clear glass panel or a complete glass door panel are not required to be marked.

[F] 905.7.2 Locking cabinet doors.
Cabinets shall be unlocked.

Exceptions:

1. Visual identification panels of glass or other *approved* transparent frangible material that is easily broken and allows access.

2. *Approved* locking arrangements.

3. Group I-3.

[F] 905.8 Dry standpipes.
Dry standpipes shall not be installed.

Exception: Where subject to freezing and in accordance with NFPA 14.

[F] 905.9 Valve supervision.
Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall also be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision.

2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.

[F] 905.10 During construction.
Standpipe systems required during construction and demolition operations shall be provided in accordance with Section 3311.

SECTION 906
PORTABLE FIRE EXTINGUISHERS

[F] 906.1 Where required.
Portable fire extinguishers shall be installed in the following locations.

1. In Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

   Exception: In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each *dwelling unit* is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.

2. Within 30 feet (9144 mm) of commercial cooking equipment.

3. In areas where flammable or combustible liquids are stored, used or dispensed.

4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with the *Florida Fire Prevention Code.*

5. Where required by the *Florida Fire Prevention Code.*

6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the fire code official.

[F] Table 906.1 Reserved.

[F] 906.2 General requirements.
Portable fire extinguishers shall be selected and installed in accordance with this section and NFPA 10.

Exceptions:

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.

2. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

[F] 906.3 Size and distribution.
The size and distribution of portable fire extinguishers shall be in accordance with Sections 906.3.1 through 906.3.4.

[F] TABLE 906.3(1)
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS

	LIGHT (Low) HAZARD OCCUPANCY	ORDINARY (Moderate) HAZARD OCCUPANCY	EXTRA (High) HAZARD OCCUPANCY
Minimum Rated Single Extinguisher	2-A[c]	2-A	4-A[a]
Maximum Floor Area Per Unit of A	3,000 square feet	1,500 square feet	1,000 square feet
Maximum Floor Area for Extinguisher[b]	11,250 square feet	11,250 square feet	11,250 square feet
Maximum Travel Distance to Extinguisher	75 feet	75 feet	75 feet

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m^2, 1 gallon = 3.785 L.

a. Two $2\frac{1}{2}$-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.
b. Annex E.3.3 of NFPA 10 provides more details concerning application of the maximum floor area criteria.
c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

[F] TABLE 906.3(2)
FIRE EXTINGUISHERS FOR FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS LESS THAN OR EQUAL TO 0.25 INCH

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAXIMUM TRAVEL DISTANCE TO EXTINGUISHERS (feet)
Light (Low)	5-B 10-B	30 50
Ordinary (Moderate)	10-B 20-B	30 50
Extra (High)	40-B 80-B	30 50

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
Note: For requirements on water-soluble flammable liquids and alternative sizing criteria, see Section 5.5 of NFPA 10.

[F] 906.3.1 Class A fire hazards.
The minimum sizes and distribution of portable fire extinguishers for occupancies that involve primarily Class A fire hazards shall comply with Table 906.3(1).

[F] 906.3.2 Class B fire hazards.
Portable fire extinguishers for occupancies involving flammable or combustible liquids with depths less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2).

Portable fire extinguishers for occupancies involving flammable or combustible liquids with a depth of greater than 0.25-inch (6.35 mm) shall be selected and placed in accordance with NFPA 10.

[F] 906.3.3 Class C fire hazards.
Portable fire extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or B hazard.

[F] 906.3.4 Class D fire hazards.
Portable fire extinguishers for occupancies involving combustible metals shall be selected and placed in accordance with NFPA 10.

[F] 906.4 Cooking grease fires.
Fire extinguishers provided for the protection of cooking grease fires shall be of an *approved* type compatible with the automatic fire-extinguishing system agent and in accordance with the *Florida Fire Prevention Code.*

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

[F] 906.6 Unobstructed and unobscured.
Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, means shall be provided to indicate the locations of extinguishers.

[F] 906.7 Hangers and brackets.
Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

[F] 906.8 Cabinets.
Cabinets used to house portable fire extinguishers shall not be locked.

Exceptions:

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.

2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

[F] 906.9 Extinguisher installation.
The installation of portable fire extinguishers shall be in accordance with Sections 906.9.1 through 906.9.3.

[F] 906.9.1 Extinguishers weighing 40 pounds or less.
Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 5 feet (1524 mm) above the floor.

[F] 906.9.2 Extinguishers weighing more than 40 pounds.
Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that their tops are not more than 3.5 feet (1067 mm) above the floor.

[F] 906.9.3 Floor clearance.
The clearance between the floor and the bottom of installed hand-held portable fire extinguishers shall not be less than 4 inches (102 mm).

[F] 906.10 Wheeled units.
Wheeled fire extinguishers shall be conspicuously located in a designated location.

SECTION 907
FIRE ALARM AND DETECTION SYSTEMS

[F] 907.1 General.
This section covers the application, installation, performance and maintenance of fire alarm systems and their components.

[F] 907.1.1 Construction documents.
Construction documents for fire alarm systems shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code, the *Florida Fire Prevention Code*, and relevant laws, ordinances, rules and regulations, as determined by the fire code official.

[F] 907.1.2 Fire alarm shop drawings.
Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation, and shall include, but not be limited to, all of the following:

1. A floor plan that indicates the use of all rooms.
2. Locations of alarm-initiating devices.
3. Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.
4. Location of fire alarm control unit, transponders and notification power supplies.
5. Annunciators.
6. Power connection.
7. Battery calculations.
8. Conductor type and sizes.
9. Voltage drop calculations.
10. Manufacturers' data sheets indicating model numbers and listing information for equipment, devices and materials.
11. Details of ceiling height and construction.
12. The interface of fire safety control functions.
13. Classification of the supervising station.

[F] 907.1.3 Equipment.
Systems and components shall be *listed* and *approved* for the purpose for which they are installed.

907.1.4 Accessibility.
Every required fire alarm system shall include a visible alarm indicating appliances in public and common areas. For more specific accessibility requirements related to alarm indicating appliances, refer to applicable sections of the *Florida Building Code, Accessibility.*

[F] 907.2 Where required—new buildings and structures.
An *approved* fire alarm system installed in accordance with the provisions of this code and

NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an *approved* location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.

2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the fire code official to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event.Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.

[F] 907.2.1 Group A.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

[F] 907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more.
Activation of the fire alarm in Group A occupancies with an *occupant load* of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.5.2.2.

Exception: Where *approved*, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an *approved*, *constantly attended location*.

[F] 907.2.1.2 Emergency voice/alarm communication captions.
Stadiums, arenas and grandstands required to caption audible public announcements shall be in accordance with Section 907.5.2.2.4.

[F] 907.2.2 Group B.
A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B *occupant load* of all floors is 500 or more.

2. The Group B *occupant load* is more than 100 persons above or below the lowest *level of exit discharge.*

3. The *fire area* contains an ambulatory care facility.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

[F] 907.2.2.1 Ambulatory care facilities.
Fire areas containing ambulatory care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory care facility and in public use areas outside of tenant spaces, including public *corridors* and elevator lobbies.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, provided the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

[F] 907.2.3 Group E.
A manual fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. When *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an *occupant load* of 30 or less.

2. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:

    2.1. Interior *corridors* are protected by smoke detectors.

    2.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by *heat detectors* or other *approved* detection devices.

    2.3. Shops and laboratories involving dusts or vapors are protected by *heat detectors* or other *approved* detection devices.

3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1, the emergency voice/alarm communication system will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

[F] 907.2.4 Group F.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more *stories* in height; and

2. The Group F occupancy has a combined *occupant load* of 500 or more above or below the lowest *level of exit discharge*.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an
automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler waterflow.

[F] 907.2.5 Group H.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with the *Florida Fire Prevention Code*.

[F] 907.2.6 Group I.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

Exceptions:

1. Manual fire alarm boxes in sleeping units of Group I-1 and I-2 occupancies shall not be required at *exits* if located at all care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2.1 are not exceeded.

2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is *approved* by the fire code official.

[F] 907.2.6.1 Group I-1.
In Group I-1 occupancies, an automatic smoke detection system shall be installed in

corridors, waiting areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens. The system shall be activated in accordance with Section 907.5.

Exceptions:

1. Smoke detection in *habitable spaces* is not required where the facility is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

2. Smoke detection is not required for exterior balconies.

[F] 907.2.6.1.1 Smoke alarms.
Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

[F] 907.2.6.2 Group I-2.
An automatic smoke detection system shall be installed in corridors in nursing homes, long-term care facilities, detoxification facilities and spaces permitted to be open to the corridors by Section 407.2. The system shall be activated in accordance with Section 907.4. Hospitals shall be equipped with smoke detection as required in Section 407.

Exceptions:

1. *Corridor* smoke detection is not required in smoke compartments that contain sleeping units where such units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the *corridor* side of each *sleeping unit* and shall provide an audible and visual alarm at the care provider's station attending each unit.

2. *Corridor* smoke detection is not required in smoke compartments that contain *sleeping units* where *sleeping unit* doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

[F] 907.2.6.3 Group I-3 occupancies.
Group I-3 occupancies shall be equipped with a manual fire alarm system and automatic smoke detection system installed for alerting staff.

[F] 907.2.6.3.1 System initiation.
Actuation of an automatic fire-extinguishing system, *automatic sprinkler system*, a manual fire alarm box or a fire detector shall initiate an *approved* fire alarm signal which automatically notifies staff.

[F] 907.2.6.3.2 Manual fire alarm boxes.
Manual fire alarm boxes are not required to be located in accordance with Section 907.4.2 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

[F] 907.2.6.3.2.1 Manual fire alarm boxes in detainee areas.
Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

[F] 907.2.6.3.3 Automatic smoke detection system.
An automatic smoke detection system shall be installed throughout resident housing areas, including *sleeping units* and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other *approved* smoke detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards *listed* for the purpose, are allowed when necessary to prevent damage or tampering.

2. *Sleeping units* in Use Conditions 2 and 3 as described in Section 308.

3. Smoke detectors are not required in *sleeping units* with four or fewer occupants in smoke compartments that are equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

[F] 907.2.7 Group M.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M *occupant load* of all floors is 500 or more persons.

2. The Group M *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.

Exceptions:

1. A manual fire alarm system is not required in *covered or open mall buildings* complying with Section 402.

2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler waterflow.

[F] 907.2.7.1 Occupant notification.
During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a waterflow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a *constantly attended location* from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

[F] 907.2.8 Group R-1.
Fire alarm systems and smoke alarms shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.3.

[F] 907.2.8.1 Manual fire alarm system.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two *stories* in height where all individual *sleeping units* and contiguous *attic* and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour *fire partitions* and each individual *sleeping unit* has an *exit* directly to a *public way*, *egress court* or *yard*.

2. Manual fire alarm boxes are not required throughout the building when all of the following conditions are met:

   2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2;

   2.2. The notification appliances will activate upon sprinkler waterflow; and

   2.3. At least one manual fire alarm box is installed at an *approved* location.

[F] 907.2.8.2 Automatic smoke detection system.
An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior *corridors* serving *sleeping units*.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

[F] 907.2.8.3 Smoke alarms.
Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

[F] 907.2.9 Group R-2.
Fire alarm systems and smoke alarms shall be installed in Group R-2 occupancies as required in Sections 907.2.9.1 through 907.2.9.3.

[F] 907.2.9.1 Manual fire alarm system.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies where:

1. Any *dwelling unit* or *sleeping unit* is located three or more *stories* above the lowest *level of exit discharge*;

2. Any *dwelling unit* or *sleeping unit* is located more than one *story* below the highest *level of exit discharge* of *exits* serving the *dwelling unit* or *sleeping unit*; or

3. The building contains more than 16 *dwelling units* or *sleeping units*.

Exceptions:

1. A fire alarm system is not required in buildings not more than two *stories* in height where all *dwelling units* or *sleeping units* and contiguous *attic* and crawl spaces are separated from each other and public or common areas by at least 1-hour *fire partitions* and each *dwelling unit* or *sleeping unit* has an *exit* directly to a *public way*, *egress court* or *yard*.

2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler waterflow.

3. A fire alarm system is not required in buildings that do not have interior *corridors* serving *dwelling units* and are protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that *dwelling units* either have a *means of egress* door opening directly to an exterior *exit access* that leads directly to the *exits* or are served by open-ended *corridors* designed in accordance with Section 1026.6, Exception 4.

[F] 907.2.9.2 Smoke alarms.
Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

[F] 907.2.9.3 Group R-2 college and university buildings.
An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R- 2 college and university buildings in the following locations:

1. Common spaces outside of *dwelling units* and *sleeping units*.

2. Laundry rooms, mechanical equipment rooms, and storage rooms.

3. All interior corridors serving *sleeping units* or *dwelling units*.

Required smoke alarms in *dwelling units* and *sleeping units* in Group R-2 college and university buildings shall be interconnected with the fire alarm system in accordance with NFPA 72.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* or *dwelling units* and where each

sleeping unit or dwelling unit either has a *means of egress* door opening directly to an exterior *exit access* that leads directly to an *exit* or a *means of egress* door opening directly to an exit.

[F] 907.2.10 Group R-4.
Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

[F] 907.2.10.1 Manual fire alarm system.
A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-4 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two *stories* in height where all individual *sleeping units* and contiguous *attic* and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour *fire partitions* and each individual *sleeping unit* has an *exit* directly to a *public way*, *egress court* or *yard*.

2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:

    2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2;

    2.2. The notification appliances will activate upon sprinkler waterflow; and

    2.3. At least one manual fire alarm box is installed at an *approved* location.

3. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at *exits* where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2.1 are not exceeded.

[F] 907.2.10.2 Automatic smoke detection system.
An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in *corridors*, waiting areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens.

Exceptions:

1. Smoke detection in *habitable spaces* is not required where the facility is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

2. An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit*

has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

[F] 907.2.10.3 Smoke alarms.
Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

[F] 907.2.11 Single- and multiple-station smoke alarms.
Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

[F] 907.2.11.1 Group R-1.
Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.

2. In every room in the path of the *means of egress* from the sleeping area to the door leading from the *sleeping unit*.

3. In each *story* within the *sleeping unit*, including basements. For *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.

[F] 907.2.11.2 Groups R-2, R-3, R-4 and I-1.
Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.

2. In each room used for sleeping purposes.

   Exception: Single- or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.

3. In each *story* within a *dwelling unit*, including basements but not including crawl spaces and uninhabitable *attics*. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.

[F] 907.2.11.3 Interconnection.
Where more than one smoke alarm is required to be installed within an individual *dwelling unit* or *sleeping unit* in Group R or I-1 occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation

of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

[F] 907.2.11.4 Power source.
In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system.

[F] 907.2.12 Special amusement buildings.
An automatic smoke detection system shall be provided in *special amusement buildings* in accordance with Sections 907.2.12.1 through 907.2.12.3.

[F] 907.2.12.1 Alarm.
Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately activate an audible and visible alarm at the building at a *constantly attended location* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.

[F] 907.2.12.2 System response.
The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the *automatic sprinkler system* or other *approved* fire detection device shall automatically:

1. Cause illumination of the *means of egress* with light of not less than 1 footcandle (11 lux) at the walking surface level;

2. Stop any conflicting or confusing sounds and visual distractions;

3. Activate an *approved* directional *exit* marking that will become apparent in an emergency; and

4. Activate a prerecorded message, audible throughout the *special amusement building*, instructing patrons to proceed to the nearest *exit*. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation.

[F] 907.2.12.3 Emergency voice/alarm communication system.
An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with Section 907.5.2.2 and be audible throughout the entire *special amusement building*.

[F] 907.2.13 High-rise buildings.
High-rise buildings shall be provided with an automatic smoke detection system in

accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Sections 907.2.22 and 412.

2. *Open parking garages* in accordance with Section 406.5.

3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.

4. Low-hazard special occupancies in accordance with Section 503.1.1.

5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.

6. In Group I-1 and I-2 occupancies, the alarm shall sound at a *constantly attended location* and occupant notification shall be broadcast by the emergency voice/alarm communication system.

[F] 907.2.13.1 Automatic smoke detection.
Automatic smoke detection in high-rise buildings shall be in accordance with Sections 907.2.13.1.1 and 907.2.13.1.2.

[F] 907.2.13.1.1 Area smoke detection.
Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall activate the emergency voice/alarm communication system in accordance with Section 907.5.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.10, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection.

2. In each elevator machine room and in elevator lobbies.

[M] 907.2.13.1.2 Duct smoke detection.
Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.

2. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return air riser

carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air-inlet openings.

[F] 907.2.13.2 Fire department communication system.
Where a wired communication system is *approved* in lieu of an emergency responder radio coverage system in accordance with the *Florida Fire Prevention Code,* the wired fire department communication system shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 911, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, *areas of refuge* and inside enclosed *exit stairways*. The fire department communication device shall be provided at each floor level within the enclosed *exit stairway*.

[F] 907.2.14 Atriums connecting more than two stories.
A fire alarm system shall be installed in occupancies with an atrium that connects more than two *stories*, with smoke detection installed throughout the atrium. The system shall be activated in accordance with Section 907.5. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.5.2.2.

[F] 907.2.15 High-piled combustible storage areas.
An automatic smoke detection system shall be installed throughout high-piled combustible storage areas where required by the *Florida Fire Prevention Code.*

[F] 907.2.16 Aerosol storage uses.
Aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an *approved* manual fire alarm system where required by the *Florida Fire Prevention Code.*

[F] 907.2.17 Lumber, wood structural panel and veneer mills.
Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

[F] 907.2.18 Underground buildings with smoke control systems.
Where a smoke control system is installed in an underground building in accordance with this code, automatic smoke detectors shall be provided in accordance with Section 907.2.18.1.

[F] 907.2.18.1 Smoke detectors.
A minimum of one smoke detector *listed* for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.

2. Elevator lobbies.

3. The main return and exhaust air plenum of each air-conditioning system serving more than one *story* and located in a serviceable area downstream of the last duct inlet.

4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a *listed* smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air-inlet openings.

[F] 907.2.18.2 Alarm required.
Activation of the smoke control system shall activate an audible alarm at a *constantly attended location*.

[F] 907.2.19 Deep underground buildings.
Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of the lowest *level of exit discharge*, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.5.2.2.

[F] 907.2.20 Covered and open mall buildings.

Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.5.2.2.

[F] 907.2.21 Residential aircraft hangars.
A minimum of one single-station smoke alarm shall be installed within a residential aircraft hangar as defined in Chapter 2 and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm which will be audible in all sleeping areas of the *dwelling*.

[F] 907.2.22 Airport traffic control towers.
An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the control tower cab.

[F] 907.2.23 Battery rooms.
An automatic smoke detection system shall be installed in areas containing stationary storage battery systems with a liquid capacity of more than 50 gallons (189 L).

[F] 907.3 Fire safety functions.
Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a *constantly attended location*. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

[F] 907.3.1 Duct smoke detectors.
Smoke detectors installed in ducts shall be *listed* for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a *constantly attended location* and shall perform the intended fire safety function in accordance with this code and the *Florida Building Code, Mechanical.* Duct smoke detectors shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a *constantly attended location* is not required where duct smoke detectors activate the building's alarm notification appliances.

2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an *approved* location. Smoke detector trouble conditions shall activate a visible or audible signal in an *approved* location and shall be identified as air duct detector trouble.

[F] 907.3.2 Delayed egress locks.
Where delayed egress locks are installed on *means of egress* doors in accordance with Section 1008.1.9.7, an automatic smoke or heat detection system shall be installed as required by that section.

[F] 907.3.3 Elevator emergency operation.
Automatic fire detectors installed for elevator emergency operation shall be installed in accordance with the provisions of ASME A17.1 and NFPA 72.

[F] 907.3.4 Wiring.
The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.

[F] 907.4 Initiating devices.
Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

[F] 907.4.1 Protection of fire alarm control unit.
In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station transmitting equipment.

Exception: Where ambient conditions prohibit installation of a smoke detector, a *heat detector* shall be permitted.

[F] 907.4.2 Manual fire alarm boxes.
Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm boxes installed in accordance with Sections 907.4.2.1 through 907.4.2.6.

[F] 907.4.2.1 Location.
Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each *exit*. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960 mm).

[F] 907.4.2.2 Height.
The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1372 mm) measured vertically, from the floor level to the activating handle or lever of the box.

[F] 907.4.2.3 Color.
Manual fire alarm boxes shall be red in color.

[F] 907.4.2.4 Signs.
Where fire alarm systems are not monitored by a supervising station, an *approved* permanent sign shall be installed adjacent to each manual fire alarm box that reads: WHEN ALARM SOUNDS CALL FIRE DEPARTMENT.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

[F] 907.4.2.5 Protective covers.
The fire code official is authorized to require the installation of *listed* manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless *approved*. Protective covers shall not project more than that permitted by Section 1003.3.3.

[F] 907.4.2.6 Unobstructed and unobscured.
Manual fire alarm boxes shall be accessible, unobstructed, unobscured and visible at all times.

[F] 907.4.3 Automatic smoke detection.
Where an automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors cannot be utilized due to ambient conditions, *approved* automatic *heat detectors* shall be permitted.

[F] 907.4.3.1 Automatic sprinkler system.
For conditions other than specific fire safety functions noted in Section 907.3, in areas where ambient conditions prohibit the installation of smoke detectors, an *automatic sprinkler system* installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 and that is connected to the fire alarm system shall be *approved* as automatic heat detection.

[F] 907.5 Occupant notification systems.
A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.4. Where a fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors.

2. *Automatic sprinkler system* waterflow devices.

3. Manual fire alarm boxes.

4. Automatic fire-extinguishing systems.

Exception: Where notification systems are allowed elsewhere in Section 907 to annunciate at a *constantly attended location*.

[F] 907.5.1 Presignal feature.
A presignal feature shall not be installed unless *approved* by the fire code official and the fire department. Where a presignal feature is provided, a signal shall be annunciated at a *constantly attended location approved* by the fire department, in order that occupant notification can be activated in the event of fire or other emergency.

[F] 907.5.2 Alarm notification appliances.
Alarm notification appliances shall be provided and shall be *listed* for their purpose.

[F] 907.5.2.1 Audible alarms.
Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exceptions:

1. Visible alarm notification appliances shall be allowed in lieu of audible alarm notification appliances in critical care areas of Group I-2 occupancies.

2. Where provided, audible notification appliances located in each occupant evacuation elevator lobby in accordance with Section 3008.5.1 shall be connected to a separate notification zone for manual paging only.

[F] 907.5.2.1.1 Average sound pressure.
The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupiable *space* within the building.

[F] 907.5.2.1.2 Maximum sound pressure.
The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

[F] 907.5.2.2 Emergency voice/alarm communication systems.
Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector,

sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving *approved* information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by the *Florida Fire Prevention Code.* In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Elevator groups.

2. *Exit stairways*.

3. Each floor.

4. *Areas of refuge* as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

[F] 907.5.2.2.1 Manual override.
A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

[F] 907.5.2.2.2 Live voice messages.
The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages by paging zones on a selective and all-call basis.

[F] 907.5.2.2.3 Alternate uses.
The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm use takes precedence over any other use.

[F] 907.5.2.2.4 Emergency voice/alarm communication captions.
Where stadiums, arenas and grandstands are required to caption audible public announcements in accordance with the *Florida Building Code*, *Accessibility*, the emergency/voice alarm communication system shall also be captioned. Prerecorded or live emergency captions shall be from an *approved* location constantly attended by personnel trained to respond to an emergency.

[F] 907.5.2.2.5 Emergency power.
Emergency voice/alarm communications systems shall be provided with an *approved* emergency power source.

[F] 907.5.2.3 Visible alarms.
Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.4.

Exceptions:

1. Visible alarm notification appliances are not required in *alterations*, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.

2. Visible alarm notification appliances shall not be required in *exits* as defined in Chapter 2.

3. Visible alarm notification appliances shall not be required in elevator cars.

[F] 907.5.2.3.1 Public and common areas.
Visible alarm notification appliances shall be provided in public areas and common areas.

[F] 907.5.2.3.2 Employee work areas.
Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with a minimum of 20-percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing impaired employee(s).

[F] 907.5.2.3.3 Groups I-1 and R-1.
Group I-1 and R-1 *dwelling units* or *sleeping units* in accordance with Table 907.5.2.3.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

[F] TABLE 907.5.2.3.3
VISIBLE ALARMS

NUMBER OF SLEEP UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

[F] 907.5.2.3.4 Group R-2.
In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with Chapter 10 of ICC A117.1. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the

existing wiring from the unit smoke alarm locations to required locations for visible appliances.

[F] 907.6 Installation.
A fire alarm system shall be installed in accordance with this section and NFPA 72.

[F] 907.6.1 Wiring.
Wiring shall comply with the requirements of NFPA 70 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

[F] 907.6.2 Power supply.
The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

Exception: Back-up power for single-station and multiple-station smoke alarms as required in Section 907.2.11.4.

[F] 907.6.3 Zones.
Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m^2). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

Exception: *Automatic sprinkler system* zones shall not exceed the area permitted by NFPA 13.

[F] 907.6.3.1 Zoning indicator panel.
A zoning indicator panel and the associated controls shall be provided in an *approved* location. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible-alarm silencing switch.

[F] 907.6.3.2 High-rise buildings.
In high-rise buildings, a separate zone by floor shall be provided for each of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler waterflow devices.
3. Manual fire alarm boxes.
4. Other *approved* types of automatic fire detection devices or suppression systems.

[F] 907.6.4 Access.
Access shall be provided to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.

[F] 907.6.5 Monitoring.
Fire alarm systems required by this chapter or by the *Florida Fire Prevention Code* shall be monitored by an *approved* supervising station in accordance with NFPA 72.

Exception: Monitoring by a supervising station is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.11.

2. Smoke detectors in Group I-3 occupancies.

3. *Automatic sprinkler systems* in one- and two-family dwellings.

[F] 907.6.5.1 Automatic telephone-dialing devices.
Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any fire department telephone number unless *approved* by the fire chief.

[F] 907.6.5.2 Termination of monitoring service.
Termination of fire alarm monitoring services shall be in accordance with the *Florida Fire Prevention Code*.

[F] 907.7 Acceptance tests and completion.
Upon completion of the installation, the fire alarm system and all fire alarm components shall be tested in accordance with NFPA 72.

[F] 907.7.1 Single- and multiple-station alarm devices.
When the installation of the alarm devices is complete, each device and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the smoke alarm provisions of NFPA 72.

[F] 907.7.2 Record of completion.
A record of completion in accordance with NFPA 72 verifying that the system has been installed and tested in accordance with the *approved* plans and specifications shall be provided.

[F] 907.7.3 Instructions.
Operating, testing and maintenance instructions and record drawings (“as-builts”) and equipment specifications shall be provided at an *approved* location.

[F] 907.8 Inspection, testing and maintenance.
The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with the *Florida Fire Prevention Code.*

907.9 Accessibility.
Alarm systems required to be accessible shall comply with the applicable sections of the *Florida Building Code, Accessibility.*

SECTION 908
EMERGENCY ALARM SYSTEMS

[F] 908.1 Group H occupancies.
Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided in accordance with Section 414.7.

[F] 908.2 Group H-5 occupancy.
Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 415.10.3.5. A continuous gas-detection system shall be provided for HPM gases in accordance with Section 415.10.7.

[F] 908.3 Highly toxic and toxic materials.
A gas detection system shall be provided to detect the presence of *highly toxic* or *toxic* gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the immediately dangerous to life and health (IDLH) limit.

Exception: A gas-detection system is not required for *toxic* gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

[F] 908.3.1 Alarms.
The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both visible and audible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.

Exception: Signal transmission to a constantly attended control station is not required when not more than one cylinder of *highly toxic* or *toxic* gas is stored.

[F] 908.3.2 Shutoff of gas supply.
The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.

Exception: Automatic shutdown is not required for reactors utilized for the production of *highly toxic* or *toxic* compressed gases where such reactors are:

1. Operated at pressures less than 15 pounds per square inch gauge (psig) (103.4 kPa).
2. Constantly attended.
3. Provided with readily accessible emergency shutoff valves.

[F] 908.3.3 Valve closure.
The automatic closure of shutoff valves shall be in accordance with the following:

1. When the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.

3. Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

Exception: When the gas-detection sampling point initiating the gas-detection system alarm is at a use location or within a gas valve enclosure of a branch line downstream of a piping distribution manifold, the shutoff valve in the gas valve enclosure for the branch line located in the piping distribution manifold enclosure shall automatically close.

[F] 908.4 Ozone gas-generator rooms.
Ozone gas-generator rooms shall be equipped with a continuous gas-detection system that will shut off the generator and sound a local alarm when concentrations above the PEL occur.

[F] 908.5 Repair garages.
A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 406.8.5.

[F] 908.6 Refrigerant detector.
Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification indicated in the *Florida Building Code, Mechanical*. Detectors and alarms shall be placed in *approved* locations.

[F] 908.7 Carbon monoxide protection.
Every separate building or an addition to an existing building for which a permit for new construction is issued and having a fossil-fuelburning heater or appliance, a fireplace, an attached garage, or other feature, fixture, or element that emits carbon monoxide as a byproduct of combustion shall have an operational carbon monoxide alarm installed within 10 feet of each room used for sleeping purposes in the new building or addition, or at such other locations as required by this code.

908.7.1 Carbon monoxide alarm.
The requirements of Section 908.7 shall be satisfied by providing for one of the following alarm installations:

1. A hard-wired carbon monoxide alarm.

2. A battery-powered carbon monoxide alarm.

3. A hard-wired combination carbon monoxide and smoke alarm.

4. A battery-powered combination carbon monoxide and smoke alarm.

908.7.2 Combination alarms.
Combination smoke/carbon monoxide alarms shall be listed and labeled by a nationally recognized testing laboratory.

Exceptions:

1. An approved operational carbon monoxide detector shall be installed inside or directly outside of each room or area within a hospital, inpatient hospice facility or nursing home facility licensed by the Agency for Health Care Administration, or a new state correctional institution where a fossil-fuel burning heater, engine, or appliance is located. The carbon monoxide detector shall be connected to the fire-alarm system of the hospital, inpatient hospice facility, or nursing home facility as a supervisory signal.

2. This section shall not apply to existing buildings that are undergoing alterations or repair unless the alteration is an addition as defined in Section 908.7.3.

908.7.3
Addition shall mean an extension or increase in floor area, number of stories or height of a building or structure.

SECTION 909
SMOKE CONTROL SYSTEMS

[F] 909.1 Scope and purpose.
This section applies to mechanical or passive smoke control systems when they are required by other provisions of this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *Florida Building Code, Mechanical.*

[F] 909.2 General design requirements.
Buildings, structures or parts thereof required by this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The *construction documents* shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

[F] 909.3 Special inspection and test requirements.
In addition to the ordinary inspection and test requirements which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo *special inspections* and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the *construction documents* shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved.

[F] 909.4 Analysis.
A rational analysis supporting the types of smoke control systems to be employed, their

methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted *construction documents* and shall include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.6.

[F] 909.4.1 Stack effect.
The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

[F] 909.4.2 Temperature effect of fire.
Buoyancy and expansion caused by the design fire in accordance with Section 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

[F] 909.4.3 Wind effect.
The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of Chapter 16.

[F] 909.4.4 HVAC systems.
The design shall consider the effects of the heating, ventilating and air-conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

[F] 909.4.5 Climate.
The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

[F] 909.4.6 Duration of operation.
All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

[F] 909.5 Smoke barrier construction.
Smoke barriers shall comply with Section 709, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls	$A/A_w = 0.00100$
2. Interior *exit stairways* and ramps and *exit passageways*:	$A/A_w = 0.00035$
3. Enclosed *exit access stairways* and *ramps* and all other shafts:	$A/A_w = 0.00150$
4. Floors and roofs:	$A/A_F = 0.00050$

where:

A = Total leakage area, square feet (m^2).
A_F = Unit floor or roof area of barrier, square feet

(m^2).

A_w = Unit wall area of barrier, square feet (m^2).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

[F] 909.5.1 Leakage area.
The total leakage area of the barrier is the product of the *smoke barrier* gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke control systems tested using other *approved* means such as door fan testing shall be as *approved* by the fire code official.

[F] 909.5.2 Opening protection.
Openings in *smoke barriers* shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by *fire door assemblies* complying with Section 716.5.3.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors *listed* for releasing service installed in accordance with Section 907.3.

2. Fixed openings between smoke zones that are protected utilizing the airflow method.

3. In Group I-2, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire protection-rated glazing materials in fire protection-rated frames, the area of which shall not exceed that tested. The doors shall be close-fitting within operational tolerances and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 716.5.9.3. Positive-latching devices are not required.

4. Group I-3.

5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.

[F] 909.5.2.1 Ducts and air transfer openings.
Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121°C) *smoke damper* complying with Section 717.

[F] 909.6 Pressurization method.
The primary mechanical means of controlling smoke shall be by pressure differences across

smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

[F] 909.6.1 Minimum pressure difference.
The minimum pressure difference across a *smoke barrier* shall be 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings.

In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences at least two times the maximum calculated pressure difference produced by the design fire.

[F] 909.6.2 Maximum pressure difference.
The maximum air pressure difference across a *smoke barrier* shall be determined by required door-opening or closing forces. The actual force required to open *exit* doors when the system is in the smoke control mode shall be in accordance with Section 1008.1.3. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$$F = F_{dc} + K(WA\Delta P)/2(W - d) \qquad \textbf{(Equation 9-1)}$$

where:

A = Door area, square feet (m^2).
d = Distance from door handle to latch edge of door, feet (m).
F = Total door opening force, pounds (N).
F_{dc} = Force required to overcome closing device, pounds (N).
K = Coefficient 5.2 (1.0).
W = Door width, feet (m).
ΔP = Design pressure difference, inches of water (Pa).

[F] 909.7 Airflow design method.
When *approved* by the fire code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

[F] 909.7.1 Velocity.
The minimum average velocity through a fixed opening shall not be less than:

$$v = 217.2\,[h(T_f - T_o)/(T_f + 460)]^{1/2} \qquad \textbf{(Equation 9-2)}$$

For SI: $= 119.9\,[h\,(T_f - T_o)/T_f]^{1/2}$

where:

h = Height of opening, feet (m).
T_f = Temperature of smoke, °F (K).
T_o = Temperature of ambient air, °F (K).
v = Air velocity, feet per minute (m/minute).

[F] 909.7.2 Prohibited conditions.
This method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with exiting. In no case shall airflow toward the fire exceed 200 feet per minute (1.02 m/s). Where the formula in Section 909.7.1 requires airflow to exceed this limit, the airflow method shall not be used.

[F] 909.8 Exhaust method.
When *approved* by the fire code official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92B.

[F] 909.8.1 Smoke layer.
The height of the lowest horizontal surface of the smoke layer interface shall be maintained at least 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.

[F] 909.9 Design fire.
The design fire shall be based on a rational analysis performed by the *registered design professional* and *approved* by the fire code official. The design fire shall be based on the analysis in accordance with Section 909.4 and this section.

[F] 909.9.1 Factors considered.
The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and whether the fire is likely to be steady or unsteady.

[F] 909.9.2 Design fire fuel.
Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

[F] 909.9.3 Heat-release assumptions.
The analysis shall make use of best available data from *approved* sources and shall not be based on excessively stringent limitations of combustible material.

[F] 909.9.4 Sprinkler effectiveness assumptions.
A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

[F] 909.10 Equipment.
Equipment including, but not limited to, fans, ducts, automatic *dampers* and balance *dampers*, shall be suitable for its intended use, suitable for the probable exposure temperatures that the rational analysis indicates and as *approved* by the fire code official.

[F] 909.10.1 Exhaust fans.
Components of exhaust fans shall be rated and certified by the manufacturer for the probable temperature rise to which the components will be exposed. This temperature rise shall be computed by:

$$T_s = (Q_c / mc) + (T_a) \quad \textbf{(Equation 9-3)}$$

where:

c = Specific heat of smoke at smoke layer temperature, Btu/lb°F (kJ/kg • K).
m = Exhaust rate, pounds per second (kg/s).
Q_c = Convective heat output of fire, Btu/s (kW).
T_a = Ambient temperature, °F (K).
T_s = Smoke temperature, °F (K).

Exception: Reduced T_s as calculated based on the assurance of adequate dilution air.

[F] 909.10.2 Ducts.
Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *Florida Building Code, Mechanical*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the *Florida Building Code, Mechanical,* that are constructed of *approved* fire-resistance-rated materials.

[F] 909.10.3 Equipment, inlets and outlets.
Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

[F] 909.10.4 Automatic dampers.
Automatic *dampers*, regardless of the purpose for which they are installed within the smoke control system, shall be *listed* and conform to the requirements of *approved*, recognized standards.

[F] 909.10.5 Fans.
In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the requirements of Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower (kilowatts), as determined from measurement of actual current draw, and shall have a minimum service factor of 1.15.

[F] 909.11 Power systems.
The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power systems. Secondary power shall be from an *approved* standby source complying with Chapter 27 of this code. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power.

[F] 909.11.1 Power sources and power surges.
Elements of the smoke control system relying on volatile memories or the like shall be supplied with uninterruptable power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke control system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

[F] 909.12 Detection and control systems.
Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and *listed* as smoke control equipment.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override, the presence of power downstream of all disconnects and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

[F] 909.12.1 Wiring.
In addition to meeting requirements of NFPA 70*,* all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

[F] 909.12.2 Activation.
Smoke control systems shall be activated in accordance with this section.

[F] 909.12.2.1 Pressurization, airflow or exhaust method.
Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

[F] 909.12.2.2 Passive method.
Passive smoke control systems actuated by *approved* spot-type detectors *listed* for releasing service shall be permitted.

[F] 909.12.3 Automatic control.
Where completely automatic control is required or used, the automatic-control sequences shall be initiated from an appropriately zoned *automatic sprinkler system* complying with Section 903.3.1.1, manual controls that are readily accessible to the fire department and any smoke detectors required by engineering analysis.

[F] 909.13 Control air tubing.
Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

[F] 909.13.1 Materials.
Control-air tubing shall be hard drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type in accordance with ASME B 16.18 or ASME B16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP-5 brazing alloy with solidus above 1,100ºF (593ºC) and liquids below 1,500ºF (816ºC). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices provided all of the following conditions are met:

1. Tubing shall comply with the requirements of Section 602.2.1.3 of the *Florida Building Code, Mechanical.*

2. Tubing and connected devices shall be completely enclosed within a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No.22 gage). Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male barbed adapter.

3. Tubing shall be identified by appropriately documented coding.

4. Tubing shall be neatly tied and supported within the enclosure.Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

[F] 909.13.2 Isolation from other functions.
Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

[F] 909.13.3 Testing.
Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

[F] 909.14 Marking and identification.
The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

[F] 909.15 Control diagrams.
Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the fire code official, the fire department and in the fire command center in a format and manner *approved* by the fire chief.

[F] 909.16 Fire-fighter's smoke control panel.
A fire-fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a fire command center complying with Section 911 in high-rise buildings or buildings with smoke-protected assembly seating. In all other buildings, the fire-fighter's smoke control panel shall be installed in an *approved* location adjacent to the fire alarm control panel. The fire-fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3.

[F] 909.16.1 Smoke control systems.
Fans within the building shall be shown on the fire-fighter's control panel. A clear indication of the direction of airflow and the relationship of components shall be displayed. Status indicators shall be provided for all smoke control equipment, annunciated by fan and zone, and by pilot-lamp-type indicators as follows:

1. Fans, *dampers* and other operating equipment in their normal status—WHITE.
2. Fans, *dampers* and other operating equipment in their off or closed status—RED.
3. Fans, *dampers* and other operating equipment in their on or open status—GREEN.
4. Fans, *dampers* and other operating equipment in a fault status—YELLOW/AMBER.

[F] 909.16.2 Smoke control panel.
The fire-fighter's control panel shall provide control capability over the complete smoke-control system equipment within the building as follows:

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can also be controlled from other sources within the building. This includes *stairway* pressurization fans; smoke exhaust fans; supply, return and exhaust fans; elevator shaft fans and other operating equipment used or intended for smoke control purposes.
2. OPEN-AUTO-CLOSE control over individual *dampers* relating to smoke control and that are also controlled from other sources within the building.
3. ON-OFF or OPEN-CLOSE control over smoke control and other critical equipment associated with a fire or smoke emergency and that can only be controlled from the fire-fighter's control panel.

Exceptions:

1. Complex systems, where *approved*, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit.

2. Complex systems, where *approved*, where the control is accomplished by computer interface using *approved*, plain English commands.

[F] 909.16.3 Control action and priorities.
The fire-fighter's control panel actions shall be as follows:

1. ON-OFF and OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter's control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the fire-fighter's control panel. The last control action as indicated by each fire-fighter's control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

   Exception: Power disconnects required by NFPA 70.

2. Only the AUTO position of each three-position fire-fighter's control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire-fighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

[F] 909.17 System response time.
Smoke-control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as *dampers* and fans) in the sequence necessary to prevent physical damage to the fans, *dampers*, ducts and other equipment. For purposes of smoke control, the fire-fighter's control panel response time shall be the same for automatic or manual smoke control action initiated from any other building control point. The total response time, including that necessary for detection, shutdown of operating equipment and smoke control system startup, shall allow for full operational mode to be achieved before the conditions in the space exceed the design smoke condition. The system response time for each component and their sequential relationships shall be detailed in the required rational analysis and verification of their installed condition reported in the required final report.

[F] 909.18 Acceptance testing.
Devices, equipment, components and sequences shall be individually tested. These tests, in

addition to those required by other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.

[F] 909.18.1 Detection devices.
Smoke or fire detectors that are a part of a smoke control system shall be tested in accordance with Chapter 9 in their installed condition. When applicable, this testing shall include verification of airflow in both minimum and maximum conditions.

[F] 909.18.2 Ducts.
Ducts that are part of a smoke control system shall be traversed using generally accepted practices to determine actual air quantities.

[F] 909.18.3 Dampers.
Dampers shall be tested for function in their installed condition.

[F] 909.18.4 Inlets and outlets.
Inlets and outlets shall be read using generally accepted practices to determine air quantities.

[F] 909.18.5 Fans.
Fans shall be examined for correct rotation. Measurements of voltage, amperage, revolutions per minute (rpm) and belt tension shall be made.

[F] 909.18.6 Smoke barriers.
Measurements using inclined manometers or other *approved* calibrated measuring devices shall be made of the pressure differences across *smoke barriers*. Such measurements shall be conducted for each possible smoke control condition.

[F] 909.18.7 Controls.
Each smoke zone equipped with an automatic-initiation device shall be put into operation by the actuation of one such device. Each additional device within the zone shall be verified to cause the same sequence without requiring the operation of fan motors in order to prevent damage. Control sequences shall be verified throughout the system, including verification of override from the fire-fighter's control panel and simulation of standby power conditions.

[F] 909.18.8 Special inspections for smoke control.
Smoke control systems shall be tested by a special inspector.

[F] 909.18.8.1 Scope of testing.
Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.

2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

[F] 909.18.8.2 Qualifications.
Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

[F] 909.18.8.3 Reports.
A complete report of testing shall be prepared by the special inspector or *special inspection* agency. The report shall include identification of all devices by manufacturer, nameplate data, design values, measured values and identification tag or *mark*. The report shall be reviewed by the responsible *registered design professional* and, when satisfied that the design intent has been achieved, the responsible *registered design professional* shall seal, sign and date the report.

[F] 909.18.8.3.1 Report filing.
A copy of the final report shall be filed with the fire code official and an identical copy shall be maintained in an *approved* location at the building.

[F] 909.18.9 Identification and documentation.
Charts, drawings and other documents identifying and locating each component of the smoke control system, and describing its proper function and maintenance requirements, shall be maintained on file at the building as an attachment to the report required by Section 909.18.8.3. Devices shall have an *approved* identifying tag or *mark* on them consistent with the other required documentation and shall be dated indicating the last time they were successfully tested and by whom.

[F] 909.19 System acceptance.
Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system and a written maintenance program complying with the requirements of the *Florida Fire Prevention Code* has been submitted and approved by the fire code official.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as *approved* by the fire code official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

909.20 Smokeproof enclosures.
Where required by Section 1022.10, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an enclosed interior *exit stairway* that conforms to Section 1022.2 and an open exterior balcony or ventilated vestibule meeting the requirements of this section. Where access to the roof is required by the *Florida Fire Prevention Code*, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

909.20.1 Access.
Access to the *stair* shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall not be less than the required width of the *corridor* leading to the vestibule but shall not have a width of less than 44 inches (1118 mm) and shall not have a length of less than 72 inches (1829 mm) in the direction of egress travel.

909.20.2 Construction.
The smokeproof enclosure shall be separated from the remainder of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal*

assemblies constructed in accordance with Section 711, or both. Openings are not permitted other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the *fire-resistance rating* requirements for floor assemblies.

909.20.2.1 Door closers.
Doors in a smokeproof enclosure shall be self- or automatic closing by actuation of a smoke detector in accordance with Section 716.5.9.3 and shall be installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.3 Natural ventilation alternative.
The provisions of Sections 909.20.3.1 through 909.20.3.3 shall apply to ventilation of smokeproof enclosures by natural means.

909.20.3.1 Balcony doors.
Where access to the *stairway* is by way of an open exterior balcony, the door assembly into the enclosure shall be a *fire door assembly* in accordance with Section 716.5.

909.20.3.2 Vestibule doors.
Where access to the *stairway* is by way of a vestibule, the door assembly into the vestibule shall be a *fire door assembly* complying with Section 716.5. The door assembly from the vestibule to the *stairway* shall have not less than a 20-minute *fire protection rating* complying with Section 716.5.

909.20.3.3 Vestibule ventilation.

Each vestibule shall have a minimum net area of 16 square feet (1.5 m^2) of opening in a wall facing an outer *court*, *yard* or *public way* that is at least 20 feet (6096 mm) in width.

909.20.4 Mechanical ventilation alternative.
The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply to ventilation of smokeproof enclosures by mechanical means.

909.20.4.1 Vestibule doors.
The door assembly from the building into the vestibule shall be a *fire door assembly* complying with Section 716.5.3. The door assembly from the vestibule to the *stairway* shall not have less than a 20-minute *fire protection rating* and meet the requirements for a smoke door assembly in accordance with Section 716.5.3. The door shall be installed in accordance with NFPA 105.

909.20.4.2 Vestibule ventilation.
The vestibule shall be supplied with not less than one air change per minute and the exhaust shall not be less than 150 percent of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 6 inches (152 mm) down from the top of the trap, and shall be entirely

within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling *dampers* are permitted where necessary to meet the design requirements, but *dampers* are not otherwise required.

909.20.4.2.1 Engineered ventilation system.
Where a specially engineered system is used, the system shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in the emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor-side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.4.3 Smoke trap.
The vestibule ceiling shall be at least 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward-moving air column. The height shall not be decreased unless *approved* and justified by design and test.

909.20.4.4 Stair shaft air movement system.
The *stair* shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.

909.20.5 Stair pressurization alternative.
Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that interior *exit stairways* are pressurized to a minimum of 0.10 inches of water (25 Pa) and a maximum of 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all *stairway* doors closed under maximum anticipated conditions of stack effect and wind effect.

909.20.6 Ventilating equipment.
The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the *stair* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

909.20.6.1 Ventilation systems.
Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.

2. Where encased with not less than 2 inches (51 mm) of concrete.

909.20.6.2 Standby power.
Mechanical vestibule and *stair* shaft ventilation systems and automatic fire detection systems shall be powered by an *approved* standby power system conforming to Section 403.4.8 and Chapter 27.

909.20.6.3 Acceptance and testing.
Before the mechanical equipment is *approved*, the system shall be tested in the presence of the *building official* to confirm that the system is operating in compliance with these requirements.

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

909.21.1 Pressurization requirements.
Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

909.21.2 Rational analysis.
A rational analysis complying with Section 909.4 shall be submitted with the *construction documents*.

909.21.3 Ducts for system.
Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.

909.21.4 Fan system.
The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through 909.21.4.4.

909.21.4.1 Fire resistance.
When located within the building, the fan system that provides the pressurization shall be protected with the same *fire-resistance rating* required for the elevator shaft enclosure.

909.21.4.2 Smoke detection.
The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.

909.21.4.3 Separate systems.
A separate fan system shall be used for each elevator hoistway.

909.21.4.4 Fan capacity.

The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (0.4719 m^3/s) per door, or that specified by a *registered design professional* to meet the requirements of a designed pressurization system.

909.21.5 Standby power.
The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.

909.21.6 Activation of pressurization system.
The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

909.21.7 Special inspection.
Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

909.21.8 Marking and identification.
Detection and control systems shall be marked in accordance with Section 909.14.

909.21.9 Control diagrams.
Control diagrams shall be provided in accordance with Section 909.15.

909.21.10 Control panel.
A control panel complying with Section 909.16 shall be provided.

909.21.11 System response time.
Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

SECTION 910
SMOKE AND HEAT REMOVAL

[F] 910.1 General.
Where required by this code or otherwise installed, smoke and heat vents, or mechanical smoke exhaust systems, and draft curtains shall conform to the requirements of this section.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an *approved automatic sprinkler system*.

2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, automatic smoke and heat vents shall not be required within these areas.

[F] 910.2 Where required.
Smoke and heat vents shall be installed in the roofs of buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 and 910.2.2.

Exception: In occupied portions of a building where the upper surface of the story is not a roof assembly, mechanical smoke exhaust in accordance with Section 910.4 shall be an acceptable alternative.

[F] 910.2.1 Group F-1 or S-1.
Buildings and portions thereof used as a Group F-1 or S-1 occupancy having more than 50,000 square feet (4645 m^2) in undivided area.

Exception: Group S-1 aircraft repair hangars.

[F] 910.2.2 High-piled combustible storage.
Buildings and portions thereof containing high-piled combustible stock or rack storage in any occupancy group in accordance with Section 413 and the *Florida Fire Prevention Code.*

[F] 910.3 Design and installation.
The design and installation of smoke and heat vents and draft curtains shall be as specified in Sections 910.3.1 through 910.3.5.2 and Table 910.3.

[F] TABLE 910.3

REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a]

OCCUPANCY GROUP AND COMMODITY CLASSIFICATION	DESIGNATED STORAGE HEIGHT (feet)	MINIMUM DRAFT CURTAIN DEPTH (feet)	MAXIMUM AREA FORMED BY DRAFT CURTAINS (square feet)	VENT-AREA-TO-FLOOR-AREA RATIO[c]	MAXIMUM SPACING OF VENT CENTERS (feet)	MAXIMUM DISTANCE FROM VENTS TO WALL OR DRAFT CURTAIN[b] (feet)
Group F-1 and S-1	—	$0.2 \times H^d$ but ≥ 4	50,000	1:100	120	60
High-piled Storage (see	≤ 20	6	10,000	1:100	100	60

Section 910.2.2) Class I-IV commodities (Option 1)	> 20 ≤ 40	6	8,000	1:75	100	55
High-piled Storage (see Section 910.2.2) Class I-IV commodities (Option 2)	≤ 20	4	3,000	1:75	100	55
	> 20 ≤ 40	4	3,000	1:50	100	50
High-piled Storage (see Section 910.2.2) High-hazard commodities (Option 1)	≤ 20	6	6,000	1:50	100	50
	> 20 ≤ 30	6	6,000	1:40	90	45
High-piled Storage (see Section 910.2.2) High-hazard commodities (Option 2)	≤ 20	4	4,000	1:50	100	50
	> 20 ≤ 30	4	2,000	1:30	75	40

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Additional requirements for rack storage heights in excess of those indicated shall be in accordance with the *Florida Fire Prevention Code*. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
b. Vents adjacent to walls or draft curtains shall be located within a horizontal distance not greater than the maximum distance specified in this column as measured perpendicular to the wall or draft curtain that forms the perimeter of the draft curtained area.
c. Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
d. "H" is the height of the vent, in feet, above the floor.

[F] 910.3.1 Design.
Smoke and heat vents shall be *listed* and labeled to indicate compliance with UL 793.

[F] 910.3.2 Vent operation.
Smoke and heat vents shall be capable of being operated by *approved* automatic and manual means. Automatic operation of smoke and heat vents shall conform to the provisions of Sections 910.3.2.1 through 910.3.2.3.

[F] 910.3.2.1 Gravity-operated drop-out vents.
Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire, represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

[F] 910.3.2.2 Sprinklered buildings.
Where installed in buildings provided with an *approved automatic sprinkler system*, smoke and heat vents shall be designed to operate automatically.

[F] 910.3.2.3 Nonsprinklered buildings.
Where installed in buildings not provided with an *approved automatic sprinkler system*, smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100°F (38°C) and 220°F (104°C) above ambient.

Exception: Gravity-operated drop-out vents complying with Section 910.3.2.1.

[F] 910.3.3 Vent dimensions.

The effective venting area shall not be less than 16 square feet (1.5 m^2) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).

[F] 910.3.4 Vent locations.
Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent *lot lines* and *fire walls* and 10 feet (3048 mm) or more from *fire barriers*. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

[F] 910.3.5 Draft curtains.
Where required by Table 910.3, draft curtains shall be installed on the underside of the roof in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the non-ESFR sprinklers.

[F] 910.3.5.1 Construction.
Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other *approved* materials which provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

[F] 910.3.5.2 Location and depth.
The location and minimum depth of draft curtains shall be in accordance with Table 910.3.

[F] 910.4 Mechanical smoke exhaust.
Where *approved* by the fire code official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.

[F] 910.4.1 Location.
Exhaust fans shall be uniformly spaced within each draft-curtained area and the maximum distance between fans shall not be greater than 100 feet (30 480 mm).

[F] 910.4.2 Size.

Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m^3/s). The aggregate capacity of smoke exhaust fans shall be determined by the equation:

$C = A \times 300$ (Equation 9-4)

where:

C = Capacity of mechanical ventilation required, in cubic feet per minute (m^3/s).

A = Area of roof vents provided in square feet (m^2) in accordance with Table 910.3.

[F] 910.4.3 Operation.
Mechanical smoke exhaust fans shall be automatically activated by the *automatic sprinkler system* or by *heat detectors* having operating characteristics equivalent to those described in Section 910.3.2. Individual manual controls of each fan unit shall also be provided.

[F] 910.4.4 Wiring and control.
Wiring for operation and control of smoke exhaust fans shall be connected ahead of the main disconnect and protected against exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes. Controls shall be located so as to be immediately accessible to the fire service from the exterior of the building and protected against interior fire exposure by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

[F] 910.4.5 Supply air.
Supply air for exhaust fans shall be provided at or near the floor level and shall be sized to provide a minimum of 50 percent of required exhaust. Openings for supply air shall be uniformly distributed around the periphery of the area served.

[F] 910.4.6 Interlocks.
In combination comfort air-handling/smoke removal systems or independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the *approved* smoke control sequence.

SECTION 911
FIRE COMMAND CENTER

[F] 911.1 General.
Where required by other sections of this code and in all buildings classified as high-rise buildings by this code, a fire command center for fire department operations shall be provided and shall comply with Sections 911.1.1 through 911.1.5.

[F] 911.1.1 Location and access.
The location and accessibility of the fire command center shall be *approved* by the fire chief.

[F] 911.1.2 Separation.
The fire command center shall be separated from the remainder of the building by not less than a 1-hour *fire barrier* constructed in accordance with Section 707 or *horizontal assembly* constructed in accordance with Section 711, or both.

[F] 911.1.3 Size.

The room shall be a minimum of 200 square feet (19 m^2) with a minimum dimension of 10 feet (3048 mm).

[F] 911.1.4 Layout approval.
A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation.

[F] 911.1.5 Required features.
The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.

2. The fire department communications system.

3. Fire detection and alarm system annunciator.

4. Annunciator unit visually indicating the location of the elevators and whether they are operational.

5. Status indicators and controls for air distribution systems.

6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.

7. Controls for unlocking *stairway* doors simultaneously.

8. Sprinkler valve and waterflow detector display panels.

9. Emergency and standby power status indicators.

10. A telephone for fire department use with controlled access to the public telephone system.

11. Fire pump status indicators.

12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, fire protection systems, fire-fighting equipment and fire department access and the location of *fire walls, fire barriers, fire partitions, smoke barriers* and smoke partitions.

13. An *approved* Building Information Card that contains, but is not limited to, the following information:

    13.1. General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), estimated building population (i.e., day, night, weekend);

    13.2. Building emergency contact information that includes: a list of the building's emergency contacts (e.g., building manager, building engineer, etc.) and their respective work phone number, cell phone number, email address;

13.3. Building construction information that includes: the type of building construction (e.g., floors, walls, columns, and roof assembly);

13.4. *Exit stair* information that includes: number of *exit stairs* in building, each *exit stair* designation and floors served, location where each *exit stair* discharges, *exit stairs* that are pressurized, *exit stairs* provided with emergency lighting, *each exit* stair that allows reentry, *exit stairs* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, location of sky lobby, location of freight elevator banks;

13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service;

13.6. Fire protection system information that includes: locations of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of sprinkler systems installed (e.g., dry, wet, pre-action, etc.); and

13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.

14. Work table.

15. Generator supervision devices, manual start and transfer features.

16. Public address system, where specifically required by other sections of this code.

17. Elevator fire recall switch in accordance with ASME A17.1.

18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

SECTION 912
FIRE DEPARTMENT CONNECTIONS

[F] 912.1 Installation.
Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.5.

[F] 912.2 Location.
With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be *approved* by the fire chief.

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

[F] 912.2.2 Existing buildings.
On existing buildings, wherever the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an *approved* sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" at least 6 inches (152 mm) high and words in letters at least 2 inches (51 mm) high or an arrow to indicate the location. All such signs shall be subject to the approval of the fire code official.

[F] 912.3 Access.
Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object. Access to fire department connections shall be *approved* by the fire chief.

Exception: Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 and a means of emergency operation. The gate and the means of emergency operation shall be *approved* by the fire chief and maintained operational at all times.

[F] 912.3.1 Locking fire department connection caps.
The fire code official is authorized to require locking caps on fire department connections for water-based *fire protection systems* where the responding fire department carries appropriate key wrenches for removal.

[F] 912.3.2 Clear space around connections.
A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or *approved* by the fire chief.

[F] 912.3.3 Physical protection.
Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with the *Florida Fire Prevention Code.*

[F] 912.4 Signs.
A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

[P] 912.5 Backflow protection.
The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the *Florida Building Code, Plumbing.*

SECTION 913
FIRE PUMPS

[F] 913.1 General.
Where provided, fire pumps shall be installed in accordance with this section and NFPA 20.

[F] 913.2 Protection against interruption of service.
The fire pump, driver and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

913.2.1 Protection of fire pump rooms.
Fire pumps shall be located in rooms that are separated from all other areas of the building by 2-hour *fire barriers* constructed in accordance with Section 707 or 2-hour *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. In other than high-rise buildings, separation by 1-hour *fire barriers* constructed in accordance with Section 707 or 1-hour *horizontal assemblies* constructed in accordance with Section 711, or both, shall be permitted in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

2. Separation is not required for fire pumps physically separated in accordance with NFPA 20.

[F] 913.3 Temperature of pump room.
Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

[F] 913.3.1 Engine manufacturer's recommendation.
Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

[F] 913.4 Valve supervision.
Where provided, the fire pump suction, discharge and bypass valves, and isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods:

1. Central-station, proprietary or remote-station signaling service.

2. Local signaling service that will cause the sounding of an audible signal at a *constantly attended location*.

3. Locking valves open.

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

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

[F] 913.5 Acceptance test.
Acceptance testing shall be done in accordance with the requirements of NFPA 20.

SECTION 914
EMERGENCY RESPONDER SAFETY FEATURES

[F] 914.1 Shaftway markings.
Vertical shafts shall be identified as required by Sections 914.1.1 and 914.1.2.

[F] 914.1.1 Exterior access to shaftways.
Outside openings accessible to the fire department and that open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word “SHAFTWAY” in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

[F] 914.1.2 Interior access to shaftways.
Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word “SHAFTWAY” in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

Exception: Markings shall not be required on shaftway openings that are readily discernible as openings onto a shaftway by the construction or arrangement.

[F] 914.2 Equipment room identification.
Fire protection equipment shall be identified in an *approved* manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves or other fire detection, suppression or control elements shall be identified for the use of the fire department. *Approved* signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

SECTION 915
EMERGENCY RESPONDER RADIO COVERAGE

[F] 915.1 General.
Emergency responder radio coverage shall be provided in all new buildings in accordance with the *Florida Fire Prevention Code.*

Part II

The following are responsibilities for Professional Engineers who design Fire Protection Systems under the Florida Building Code as well as Rules of Responsibility Common to all Engineers and the Grounds for Disciplinary Proceeding against engineers in violation of these rules.. These requirements specific to Professional Engineers are:

1. Requirement to take continuing education courses on the Florida Building Code. See Chapter 471.0195 F.S.

2. Rules of Responsibility Common to All Engineers. See Chapter 61G15-30, F.A.C.

3. Rules of Responsibility to Professional Engineers Concerning the Design of Fire Protection Systems. See Chapter 61G15-32, F.A.C.

4. Grounds for Disciplinary Proceedings. 61G15-19.001, F.A.C.

471.0195 Florida Building Code training for engineers.—All licensees actively participating in the design of engineering works or systems in connection with buildings, structures, or facilities and systems covered by the Florida Building Code shall take continuing education courses and submit proof to the board, at such times and in such manner as established by the board by rule, that the licensee has completed any specialized or advanced courses on any portion of the Florida Building Code applicable to the licensee's area of practice. The board shall record reported continuing education courses on a system easily accessed by code enforcement jurisdictions for evaluation when determining license status for purposes of processing design documents. Local jurisdictions shall be responsible for notifying the board when design documents are submitted for building construction permits by persons who are not in compliance with this section. The board shall take appropriate action as provided by its rules when such noncompliance is determined to exist.
History.—s. 38, ch. 2000-356; s. 23, ch. 2002-299; s. 12, ch. 2009-195.

61G15-19.001 Grounds for Disciplinary Proceedings.

(1) Pursuant to Section 471.033(2), F.S., the Board, to the extent not otherwise set forth in Florida Statutes, hereby specifies that the following acts or omissions are grounds for disciplinary proceedings pursuant to Section 471.033(1), F.S.

(2) A professional engineer shall not advertise in a false, fraudulent, deceptive or misleading manner. As used in Section 471.033(1)(f), F.S., the term "advertising goods or services in a manner which is fraudulent, false, deceptive, or misleading in form or content" shall include without limitation a false, fraudulent, misleading, or deceptive statement or claim which:

(a) Contains a material misrepresentation of facts;

(b) Omits to state any material fact necessary to make the statement in the light of all circumstances not misleading;

(c) Is intended or is likely to create an unjustified expectation;

(d) States or implies that an engineer is a certified specialist in any area outside of his field of expertise;

(e) Contains a representation or implication that is likely to cause an ordinary prudent person to misunderstand or be deceived or fails to contain reasonable warnings or disclaimers necessary to make a representation or implication not deceptive;

(f) Falsifies or misrepresents the extent of his education, training or experience to any person or to the public at large, tending to establish or imply qualification for selection for engineering employment, advancement, or professional engagement. A professional engineer shall not misrepresent or exaggerate his degree of responsibility in or for the subject matter of prior assignments;

(g) In any brochure or other presentation made to any person or to the public at large, incident to the solicitation of an engineering employment, misrepresents pertinent facts concerning a professional engineer's employer, employees, associates, joint ventures, or his or their past accomplishments with the intent and purpose of enhancing his qualifications and his works.

(3) A professional engineer, corporation or partnership shall not practice engineering under an assumed, fictitious or corporate name that is misleading as to the identity, responsibility or status of those practicing thereunder or is otherwise false, fraudulent, misleading or deceptive within the meaning of subsection 61G15-19.001(2), F.A.C. When an individual is practicing engineering as a sole proprietor under a combination of his own given name, and terms such as "engineering," "and associates" or "and company," then said person is practicing engineering under a fictitious name, and must obtain a certificate of authorization pursuant to Section 471.023(2), F.S. The name of a corporation or partnership, if otherwise authorized, may include the name or names of one or more deceased or retired members of the firm, or of a predecessor firm in a continuing line of succession. An engineering firm may not offer services to the public under a firm name which contains only the name of an individual not licensed as a professional engineer, registered architect, land surveyor, landscape architect, or professional geologist, in any state.

(4) A professional engineer shall not be negligent in the practice of engineering. The term negligence set forth in Section 471.033(1)(g), F.S., is herein defined as the failure by a professional engineer to utilize due care in performing in an engineering capacity or failing to have due regard for acceptable standards of engineering principles. Professional engineers shall approve and seal only those documents that conform to acceptable engineering standards and safeguard the life, health, property and welfare of the public.

Failure to comply with the procedures set forth in the Responsibility Rules as adopted by the Board of Professional Engineers shall be considered as non-compliance with this section unless the deviation or departures therefrom are justified by the specific circumstances of the project in question and the sound professional judgment of the professional engineer.

(5) A professional engineer shall not be incompetent to practice engineering. Incompetence in the practice of engineering as set forth in Section 471.033(1)(g), F.S., shall mean the physical or mental incapacity or inability of a professional engineer to perform the duties normally required of the professional engineer.

(6) A professional engineer shall not commit misconduct in the practice of engineering. Misconduct in the practice of engineering as set forth in Section 471.033(1)(g), F.S., shall include, but not be limited to:

(a) Expressing an opinion publicly on an engineering subject without being informed as to the facts relating thereto and being competent to form a sound opinion thereupon;

(b) Being untruthful, deceptive, or misleading in any professional report, statement, or testimony whether or not under oath or omitting relevant and pertinent information from such

report, statement or testimony when the result of such omission would or reasonably could lead to a fallacious conclusion on the part of the client, employer or the general public;

(c) Performing an engineering assignment when not qualified by training or experience in the practice area involved;

1. All professional engineer asbestos consultants are subject to the provisions of Sections 455.301-.309, F.S., Chapter 471, F.S., and Rule 61G15-19, F.A.C., and shall be disciplined as provided therein.

2. The approval of any professional engineer as a "special inspector" under the provisions of Chapter 553, F.S., does not constitute acceptance by the Board that any such professional engineer is in fact qualified by training or experience to perform the duties of a "special inspector" by virtue of training or experience. Any such professional engineer must still be qualified by training or experience to perform such duties and failure to be so qualified could result in discipline under this chapter or Chapter 471, F.S.;

(d) Affixing a signature or seal to any engineering plan of document in a subject matter over which a professional engineer lacks competence because of inadequate training or experience;

(e) Offering directly or indirectly any bribe or commission or tendering any gift to obtain selection or preferment for engineering employment with the exception of the payment of the usual commission for securing salaried positions through licensed employment agencies;

(f) Becoming involved in a conflict of interest with an employer or client, without the knowledge and approval of the client or employer, but if unavoidable a professional engineer shall immediately take the following actions:

1. Disclose in writing to his employer or client the full circumstances as to a possible conflict of interest; and

2. Assure in writing that the conflict will in no manner influence the professional engineer's judgment or the quality of his services to his employer or client; and

3. Promptly inform his client or employer in writing of any business association, interest or circumstances which may be influencing his judgment or the quality of his services to his client or employer;

(g) Soliciting or accepting financial or other valuable considerations from material or equipment suppliers for specifying their products without the written consent to the engineer's employer or client;

(h) Soliciting or accepting gratuities directly or indirectly from contractors, their agents or other parties dealing with the professional engineer's client or employer in connection with work for which the professional engineer is responsible without the written consent of the engineer's employer or client;

(i) Use by a professional engineer of his engineering expertise and/or his professional engineering status to commit a felony;

(j) Affixing his seal and/or signature to plans, specifications, drawings, or other documents required to be sealed pursuant to Section 471.025(1), F.S., when such document has not been personally prepared by the engineer or prepared under his responsible supervision, direction and control;

(k) A professional engineer shall not knowingly associate with or permit the use of his name or firm name in a business venture by any person or firm which he knows or has reason to believe is engaging in business or professional practices of a fraudulent or dishonest nature;

(l) If his engineering judgment is overruled by an unqualified lay authority with the results that the public health and safety is threatened, failure by a professional engineer to inform his employer, responsible supervision and the responsible public authority of the possible circumstances;

(m) If a professional engineer has knowledge or reason to believe that any person or firm is

guilty of violating any of the provisions of Chapter 471, F.S., or any of these rules of professional conduct, failure to immediately present this information to FEMC;

(n) Violation of any law of the State of Florida directly regulating the practice of engineering;

(o) Failure on the part of any professional engineer or certificate holder to obey the terms of a final order imposing discipline upon said professional engineer or certificate holder;

(p) Making any statement, criticism or argument on engineering matters which is inspired or paid for by interested parties, unless the professional engineer specifically identifies the interested parties on whose behalf he is speaking, and reveals any interest he or the interested parties have in such matters;

(q) Sealing and signing all documents for an entire engineering project, unless each design segment is signed and sealed by the professional engineer in responsible charge of the preparation of that design segment;

(r) Revealing facts, data or information obtained in a professional capacity without the prior consent of the professional engineer's client or employer except as authorized or required by law.

(7) A professional engineer who performs building code inspector or plans examiner duties in accordance with Section 471.045, F.S., or Sections 468.603(6), (7), F.S., shall be subject to disciplinary action for commission of the following:

(a) Violating or failing to comply with any provision of Chapter 471, F.S., or the rules of the Board of Professional Engineers;

(b) Having been convicted of a crime in any jurisdiction which directly relates to the practice of building code inspection or plans examination;

(c) Making or filing a false report or record, inducing another to file a false report or record, failing to file a report or record required by state or local law, impeding or obstructing such filing, or inducing another person to impede or obstruct such filing.

(8) A professional engineer shall not be negligent in the practice of engineering while performing duties as a special inspector. Negligence is herein defined as the failure by a professional engineer to utilize due care in performing in an engineering capacity or failing to have due regard for acceptable standards of engineering and special inspection principles. Failure to comply with the procedures set forth in the Responsibility Rules for Professional Engineers Providing Threshold Building Inspection, as adopted by the Board of Professional Engineers, shall be considered non-compliance with this section unless the deviation or departures therefrom are justified by the specific circumstances of the project in question and the sound professional judgment of the engineer.

Specific Authority 471.033(2) FS. Law Implemented 471.025(1), 471.033(1)(f), (g), (2) FS. History–New 1-8-80, Amended 6-23-80, 3-23-81, 6-4-85, Formerly 21H-19.01, Amended 5-14-86, 4-23-87, 11-8-88, 1-11-89, 7-3-90, 11-9-92, Formerly 21H-19.001, Amended 11-27-94, 5-20-02.

CHAPTER 61G15-30
RESPONSIBILITY RULES COMMON TO ALL ENGINEERS

61G15-30.001 Purpose.

The Board has adopted these responsibility rules pursuant to Section 471.033(2), F.S., to safeguard the life, health, property and welfare of the public by promoting proper conduct in the practice of engineering and due care and regard for acceptable engineering principles and standards. The Board considers that professional engineers may avoid disciplinary actions by observing the procedures set forth herein. Failure to comply with these rules may be considered as noncompliance with subsection 61G15-19.001(4), F.A.C., unless the deviation or departure therefrom is justified by the specific circumstances of the project in question. Furthermore, these rules are intended to apply as general guidelines where no contractual relationship exists between the parties addressed herein. These rules are not intended to take precedence over contractual relationships developed between the parties addressed herein, so long as those contractual relationships do not violate Chapter 471, F.S., or the stated purpose of these responsibility rules. These responsibility rules shall apply to every person holding a certificate of registration as a professional engineer, every certified engineer intern, and every holder of a certificate of authorization, as appropriate. A professional engineer’s practices, education, training, experience, qualifications, technical competence, conduct, and responsibilities in connection with his authorized engineering practice, services, and creative work are subject to regulation solely by the Board of professional engineers, the courts, and local jurisdictions.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1) FS. History–New 1-26-93, Formerly 21H-30.001, Amended 11-13-08.

61G15-30.002 Definitions Common to All Engineer’s Responsibility Rules.

(1) Engineer of Record. A Florida professional engineer who is in responsible charge for the preparation, signing, dating, sealing and issuing of any engineering document(s) for any engineering service or creative work.

(2) Prime Professional. A Florida professional engineer or a duly qualified engineering corporation or partnership, who is engaged by the client to provide any planning, design, coordination, arrangement and permitting for the project and for construction observations in connection with any engineering project, service or creative work. The prime professional engineer may also be an engineer of record on the same project.

(3) Delegated Engineer. A Florida professional engineer who undertakes a specialty service and provides services or creative work (delegated engineering document) regarding a portion of the engineering project. The delegated engineer is the engineer of record for that portion of the engineering project. A delegated engineer usually falls into one of the following categories:

(a) An independent consultant.

(b) An employee or officer of an entity supplying components to a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.

(c) An employee or officer of a fabricator or contractor, so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation.

(4) Engineering Documents. Engineering documents are designs, plans, specifications, drawings, prints, reports, or similar instruments of service in connection with engineering services or creative work that have been prepared and issued by the professional engineer or under his responsible supervision, direction or control.

(5) Delegated Engineering Documents. Delegated engineering documents are those engineering documents that are prepared by a delegated engineer.

(6) Public Record. An engineering document is "filed for public record" when said document is presented with the engineer of record's knowledge and consent to any federal, state, county, district, authority, municipal or other governmental agency in connection with the transaction of official business with said agency.

(7) "Engineering Documents Prepared for Public Record" are those documents filed for public record with the Authority Having Jurisdiction (AHJ) to determine compliance with Codes and Standards and to be used for execution of the project. These documents are required to be signed and sealed.

(8) Shop Drawings: Drawings depicting installation means and methods, catalog information on standard products, prepared by a contractor, manufacturers, or professional engineers for incorporation into the project which are prepared based on engineering direction contained in Engineering Documents. Shop drawings do not require the signature, date and seal of a professional engineer.

(9) Record Documents: Documents that are a compiled representation of the constructed project. If the engineer is relying on information provided by others not under the direct supervision and control of the engineer, then the engineer shall not be required to sign, date and seal these Documents. If relying on information by others, as a minimum, the following shall be included on the Documents:

(a) Statement that the documents are a compiled representation of the constructed project.

(b) Listing of the sources and basis of information used in the preparation of the Documents.

(c) Statement that the Documents are believed to be correct to the best of the engineer's knowledge, and that the accuracy of the information cannot be guaranteed.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1), 471.023, 471.025 FS. History–New 1-26-93, Formerly 21H-30.002, Amended 11-13-08.

61G15-30.003 Minimum Requirements for Engineering Documents.

(1) Engineering Documents are prepared in the course of performing engineering services. When prepared for inclusion with an application for a general building permit, the Documents shall meet all Engineer's Responsibility Rules, set forth in Chapters 61G15-31, 61G15-32, 61G15-33, and 61G15-34, F.A.C., and be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of the Florida Building Code, adopted in Section 553.73, F.S., and applicable laws, ordinances, rules and regulations, as determined by the AHJ. The Documents shall include:

(a) Information that provides material specifications required for the safe operation of the system that is a result of engineering calculations, knowledge and experience.

(b) List Federal, State, Municipal, and County standards, codes, ordinances, laws, and rules, with their effective dates, that the Engineering Documents are intended to conform to.

(c) Information, as determined by the Engineer of Record, needed for the safe and efficient operation of the system.

(d) List engineering design criteria; reference project specific studies, reports, and delegated Engineering Documents.

(e) Identify clearly elements of the design that vary from the governing standards and depict/identify the alternate method used to ensure compliance with the stated purpose of these Responsibility Rules.

(2) Engineers shall legibly indicate their name and business address, on engineering documents. Engineering documents which are issued for preliminary or conceptual use, shall clearly note the intended purpose of such documents.

(3) When elements of the project are shown on an engineering document only for information or clarification and the Engineer does not intend to accept responsibility for the elements, the engineer shall clearly note on the documents the extent of his responsibility.

(4) Engineering drawings shall be legible and clearly define and delineate the work in the project. They must also comply with Chapter 61G15-23, F.A.C., Seals.

(5) Engineers shall clearly note on any preliminary engineering documents that such documents are not in final form, but are being transmitted to the public agency to receive agency reviews, comments and interpretations. The documents may subsequently be revised by the engineer to reflect resolution of issues with the public agency prior to final action by the agency. Changes, revisions and modifications to a project may prompt additional document submittal for agency approval action on the same project.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g), 471.025(3) FS. History–New 1-26-93, Formerly 21H-30.003, Amended 11-13-08.

61G15-30.004 Engineering Document Submittal to Public Agencies.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g), 471.025 FS. History–New 1-26-93, Formerly 21H-30.004, Repealed 2-11-08.

61G15-30.005 Delegation of Engineering Documents: Obligations of the Engineer of Record.

(1) An engineer of record who delegates a portion of his responsibility to a delegated engineer is obligated to communicate in writing his engineering requirements to the delegated engineer.

(2) An engineer of record who delegates a portion of his design responsibility to a delegated engineer shall require submission of delegated engineering documents prepared by the delegated engineer and shall review those documents for compliance with his written engineering requirements and to confirm the following:

(a) That the delegated engineering documents have been prepared by an engineer.

(b) That the delegated engineering documents of the delegated engineer conform with the intent of the engineer of record and meet the written criteria.

(c) That the effect of the delegated engineer's work on the overall project generally conforms with the intent of the engineer of record.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g) FS. History–New 1-26-93, Formerly 21H-30.005.

61G15-30.006 Delegation of Engineering Documents: Obligations of the Delegated Engineer of Record.

(1) It is the delegated engineer's responsibility to review the Engineer of Record's written engineering requirements and authorization for the delegated engineering document to determine the appropriate scope of engineering.

(2) The delegated engineering document shall comply with the written engineering requirements received from the engineer of record. They shall include the project identification and the criteria used as a basis for its preparation. If a delegated engineer determines there are details, features or unanticipated project limits which conflict with the written engineering requirements provided by the engineer of record, the delegated engineer shall timely contact the engineer of record for resolution of conflicts.

(3) The delegated engineer shall forward the delegated engineering document to the engineer of record for review. All final delegated engineering documents require the impressed seal and signature of the delegated engineer and include:

(a) Drawings introducing engineering input such as defining the configuration and structural capacity of structural components and/or their assembly into structural systems.

(b) Calculations.

(c) Computer printouts which are an acceptable substitute for manual calculations provided they are accompanied by sufficient design assumptions and identified input and output information to permit their proper evaluation. Such information shall bear the impressed seal and signature of the delegated engineer as an indication that said engineer has accepted responsibility for the results.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g) FS. History–New 1-26-93, Formerly 21H-30.006.

61G15-30.007 Prime Professional's Responsibility.

It is the responsibility of the prime professional engineer, where one exists, to retain and coordinate the services of such other professionals as needed to complete the services contracted for the project.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g) FS. History–New 1-26-93, Formerly 21H-30.007, Amended 11-13-08.

61G15-30.008 Use of Computer Software and Hardware.

The engineer shall be responsible for the results generated by any computer software and hardware that he or she uses in providing engineering services.

Specific Authority 471.033(2), 471.008 FS. Law Implemented 471.033(1)(g) FS. History–New 1-26-93, Formerly 21H-30.008.

61G15-30.009 Retention of Engineering Documents.

At least one copy of all documents displaying the licensee's signature, seal, date and all related calculations shall be retained by the licensee or the licensee's employer for a minimum of three years from the date the documents were sealed. These documents shall be maintained in hardcopy or electronic format

Specific Authority 471.008, 471.033(2) FS. Law Implemented 471.033(1)(g), (j) FS. History–New 5-9-04, Amended 11-13-08.

61G15-30.010 Energy Conservation Compliance.

The engineer who prepares the compliance calculations, and certifies the accuracy thereof, shall verify that the building construction documents conform to compliance calculations. Data used in calculations shall be under the signature, date and seal of the responsible design professionals. The Engineer of Record for energy conservation compliance calculations shall retain the signed, dated and sealed data as provided for in Rule 61G15-30.009, F.A.C., Retention of Engineering Documents.

Specific Authority 471.008, 471.033(2) FS. Law Implemented 471.033(1)(g), (j) FS History–New 11-13-08.

CHAPTER 61G15-32
RESPONSIBILITY RULES OF PROFESSIONAL ENGINEERS CONCERNING THE DESIGN OF FIRE PROTECTION SYSTEMS

61G15-32.001 General Responsibility.

Fire protection engineering documents shall be prepared in accordance with applicable technology and the requirements of the authority having jurisdiction. The documents shall identify the Engineer of Record for the project. Both the Engineer of Record for the fire protection system and the delegated engineer, if utilized, shall comply with the requirements of the general responsibility rules, Chapter 61G15-30, F.A.C., and with the requirements of the more specific rules contained herein. The Engineer of Record for the Fire Protection System(s) shall provide design requirements in writing to the delegated engineer if one is used and shall review the design documents of the delegated engineer for conformance with his written instructions in accordance with Rule 61G15-30.005, F.A.C. Any Fire Protection Delegated Engineering Documents must be included in the final set of documents filed for permit.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.033 FS. History–New 5-19-93, Formerly 21H-32.001, Amended 3-26-09.

61G15-32.002 Definitions.

(1) Engineer of Record for the Fire Protection System(s): The Florida Registered Professional Engineer who develops the Fire Protection System(s) design criteria; performs analysis as required: and is responsible for the preparation of the Fire Protection System Engineering Documents. Except to the limited extent provided in subsection 61G15-32.002(10),

F.A.C., the Engineer of Record for the Fire Protection system(s) is responsible for providing sealed, signed and dated Fire Protection System Engineering Documents that are in full conformity with the applicable design standards set forth in Rule Chapter 61G15-32, F.A.C.

(2) Fire Protection Component: Any individual part, subsystem or device to be incorporated in a Fire Protection System.

(3) Fire Protection System: Any assembly of Fire Protection components, materials, equipment, which require design to form a fully functional fire protection system.

(4) Listed: A fire protection component tested by a nationally recognized fire protection equipment testing organization. Recognized organizations include Underwriters Laboratories, Inc. and Factory Mutual Research Corporation.

(5) Fire Protection System Engineering Documents: The fire protection system engineering drawings, specifications, prescriptive and performance criteria, water supply analysis and other materials or representations, which are submitted with the general construction documents pursuant to Section 553.79(6), F.S., that set forth the overall design requirements and provide sufficient direction for the contractor to layout the construction, alteration, demolition, renovation, repair, modification, permitting and such, for any public or private fire protection system(s), which are prepared, signed, dated and sealed by the Engineer of Record for the Fire Protection System(s).

(6) Fire Protection System Layout Documents: Layout drawings, hydraulic calculations, catalog information on standard products, and other construction data prepared by the licensed contractor or Engineer of Record that provides detail on the location of risers, cross mains, branch lines, sprinkler heads, sizing of pipe, hanger locations, and hydraulic calculations and also serves as a guide for fabrication and installation of a fire protection system. Fire Protection System Layout Documents are based upon engineering direction provided in the Fire Protection System Engineering Documents and require no additional engineering input. These documents do not require the seal of a Florida registered engineer.

(7) Codes and Standards: Those nationally recognized codes and standards adopted directly or by reference in Chapter 633, F.S., Florida Building Code (2007) and Florida Fire Prevention Code set forth in Chapter 69A-60, F.A.C. Applicable codes and standards also include those promulgated by State and local authorities having jurisdiction. In the event the codes and standards fail to cover or address a specific protection requirement, alternative research, test results, and engineering data may be utilized, relying on the Engineer of Record for Fire Protection to make an informed engineering decision. This definition is not intended to preclude the use of new technologies when said technology has been demonstrated to provide equivalent or improved protection above that of published National Fire Protection standards.

(8) Material Deviation: Any deviation from the design parameters established and documented by the Engineer of Record.

(9) Layout: The location of risers, cross mains, branch lines, sprinkler heads, sizing of pipe, hanger locations, and hydraulic calculations based on engineering documents.

(10) Fire Protection Delegated Engineering Documents. Fire Protection System Engineering Documents prepared by a delegated engineer to whom the Engineer of Record for the Fire Protection System has contractually delegated responsibility for the design to be simultaneously submitted for permit of a discrete and limited portion of a fire protection system and which are signed, sealed and dated by the delegated engineer. These documents shall be reviewed and approved by the Engineer of Record for the Fire Protection System for conformity with the Engineer of Record's design intent and shall be included in the engineering design documents prepared prior to submittal for a building permit and Fire Department installation permit, except when no building permit is required. When no building permit is required, the delegated engineering work bearing the seal of delegated engineer and approval of the Engineer of

Record for the Fire Protection System shall be submitted together to the fire official for permitting.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.005(7), 471.033(2) FS. History–New 5-19-93, Formerly 21H-32.002, Amended 4-2-00, 6-26-01, 3-26-09, 10-11-10.

61G15-32.003 Common Requirements to All Fire Protection Engineering Documents.

(1) The Fire Protection System Engineering Documents shall provide the engineering requirements to be used in the preparation of the Fire Protection System Layout Documents and to indicate the nature and scope of the work, and to describe, detail, dimension, label and define the Fire Protection Components, System(s), materials, assemblies, equipment and its structural and utility support system(s), insofar as they involve the safeguarding of life, health or property.

(2) The Fire Protection System Engineering Documents shall specify the applicable requirements for the acceptance testing of the fire protection system and components, which shall be based upon applicable codes and standards, where available.

(3) The occupancy of the area or description of a specific hazard being protected by the Fire Protection System(s) shall be shown on the Fire Protection System Engineering Documents.

(4) The applicable code and standard to be used in the preparation of the Fire Protection System Layout Documents shall be shown on the Fire Protection System Engineering Documents. When codes and standards are not available or applicable, and said layout documents are to be based on engineering judgment, any reasons and assumptions made to develop the fire protection concept shall be identified on the Fire Protection System Engineering Documents.

(5) Structural support and structural openings required by the Fire Protection System shall be shown on the Fire Protection System Engineering Documents and shall be referenced on structural engineering documents.

(6) When layout documents contain material deviation from the Engineer of Record's Fire Protection System Engineering Document, such layout documents are not compliant unless they are accompanied by revised Engineering Documents made and sealed by the Engineer of Record for the Fire Protection System.

(7) Requirements for activation control systems, sequence, operating parameters, interlocks, safety related devices, indicators and alarms, shall be shown on the Fire Protection System Engineering Documents, unless shown on other related documents.

(8) Any information deemed appropriate by the Engineer of Record to assist the authority having jurisdiction in understanding the owner's intended use and proposed protection of the building or facility and to provide sufficient direction to the installation contractor or other interested parties regarding the layout of the system(s), shall be included in the Fire Protection System Engineering Documents.

(9) Fire Protection Electrical Engineering Documents shall additionally meet the requirements of Rule 61G15-30.003, F.A.C., Engineering Documents.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.005(7), 471.033(2) FS. History–New 5-19-93, Formerly 21H-32.003, Amended 4-2-00, 6-26-01, 3-26-09.

61G15-32.004 Design of Water Based Fire Protection Systems.

(1) Water Based Fire Protection Systems include, but are not limited to, automatic sprinkler systems of wet, dry, fine water spray (mist), manual, and deluge valve controlled types, pumping systems, standpipes, fire water mains and dedicated fire protection water sources.

(2) To ensure minimum design quality in Fire Protection System Engineering Documents, said documents shall include as a minimum the following information when applicable:

(a) The Point of Service for the fire protection water supply as defined by Section 633.021(18), F.S.

(b) Applicable NFPA standard to be applied, or in the case where no such standard exists, the engineering study, judgments, and/or performance based analysis and conclusions.

(c) Classification of hazard occupancy for each room or area.

(d) Design approach, which includes system type, densities, device temperature rating, and spacing for each separate hazard occupancy.

(e) Characteristics of water supply to be used, such as main size and location, whether it is dead-end or circulating; and if dead-end, the distance to the nearest circulating main, as well as its minimum duration and reliability for the most hydraulically demanding design area.

(f) When private or public water supplies are used, the flow test data, including date and time of test, who conducted test or supplied information, test elevation, static gauge pressure at no flow, flow rate with residual gauge pressure, hydrant butt coefficient, and location of test in relation to the hydraulic point of service.

(g) Valving and alarm requirements to minimize potential for impairments and unrecognized flow of water.

(h) Microbial Induced Corrosion (MIC). The Engineer of Record shall make reasonable efforts to identify water supplies that could lead to Microbial Induced Corrosion (MIC). Such efforts may consist of discussions with the local water purveyor and/or fire official, familiarity with conditions in the local area, or laboratory testing of water supplies. When conditions are found that may result in MIC contamination of the fire protection piping, the engineer shall design corrective measures.

(i) Backflow prevention and metering specifications and details to meet local water purveyor requirements including maximum allowable pressure drop.

(j) Quality and performance specifications of all yard and interior fire protection components.

(3) Contractor submittals which deviate from the above minimum design parameters shall be considered material deviations and require supplemental engineering approval and documentation.

(4) In the event the Engineer of Record provides more information and direction than is established above, he or she shall be held responsible for the technical accuracy of the work in accordance with applicable codes, standards, and sound engineering principles.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.005(7), 471.033(2) FS. History–New 5-19-93, Formerly 21H-32.004, Amended 4-2-00, 6-26-01.

61G15-32.005 Design of Gas Agent Fire Suppression Systems.

(1) Gas Agent Fire Suppression Systems include, but are not limited to, CO_2, Halon, inerting and purge gases, and all other gaseous formulations and multi-phase agents released for the purpose of fire control or extinguishment.

(2) The Fire Protection System(s) design specifications shall be based on applicable NFPA standards when available, or alternative engineering sources and good engineering practice when required.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.033 FS. History–New 5-19-93, Formerly 21H-32.005.

61G15-32.006 Design of Foam and Foam Water Fire Suppression Systems.

(1) Foam and Foam Water Fire Suppression Systems include local application, total flooding, high and low expansion foams, and foam-water sprinkler systems.

(2) The Fire Protection System design specifications shall be based on applicable NFPA standards, when available, or alternative engineering sources and good engineering practice when required.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.033 FS. History–New 5-19-93, Formerly 21H-32.006.

61G15-32.007 Design of Dry Chemical and Miscellaneous Fire Suppression or Control Systems.

(1) Dry chemical and miscellaneous systems include, but are not limited to, dry chemical systems, explosion control systems, and fire control structures.

(2) The Fire Protection System design specifications shall be based on applicable NFPA standards, when available, or alternative engineering sources and good engineering practice when required.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.033 FS. History–New 5-19-93, Formerly 21H-32.007.

61G15-32.008 Design of Fire Alarms and Detection Systems.

(1) Fire alarms and detection systems include fire protection supervision, emergency alarm circuits, activation of life safety system controls and remote signaling of emergency conditions.

(2) The design specifications shall be based on the Florida Building Code (2007), the Florida Fire Prevention Code, or as required by the local authority having jurisdiction.

(3) For fire alarm plans on small systems below the threshold requirements for mandatory use of professional engineering services, the Engineer of Record shall specify the minimum system requirements.

(4) To ensure minimum design quality of Fire Alarm and Detection Systems Engineering Documents, said documents shall include as a minimum the following information when applicable:

(a) The plans shall be clear, with a symbols legend, system riser diagram showing all initiation and notification components, and cabling requirements. Indicate locations where fire ratings are required as determined by the system's survivability requirements. Identify the general occupancy of the protected property, and for each room and area unless it is clear from features shown.

(b) Locate initiation and notification devices and connections to related systems on the floor plans and sections when needed for clarity. Related systems include elevator controls smoke control systems, dampers, and doors.

(c) Strobe intensity and speaker output ratings for all notification devices.

(d) Identify the Class and Style of circuits as listed in the NFPA 72.

(e) Identify the functions required by the alarm and control systems including the transmission of emergency signals being monitored or annunciated.

(f) Indicate whether the fire alarm is conventional or addressable, and indicate all zoning.

(g) Locate surge protective devices and required protective features.

(h) Locate system devices that are subject to environmental factors, and indicate requirements for the protection of equipment from temperature, humidity or corrosive atmospheres, including coastal salt air.

(i) The plans shall include a site plan of the immediate area around the protected building, structure or equipment when alarm devices are required outside the structure.

(j) In buildings were smoke detection will be obstructed by walls, beams or ceiling features, the Engineer of Record shall provide applicable design and details to direct the installer to mitigate the obstructions. In buildings with smoke detection under a pitched roof, the plans shall indicate the roof pitch and a building section shall be provided as part of the Engineering Design Documents.

(k) Fire detection systems utilizing smoke detection in situations where smoke stratification is anticipated, the design shall provide the necessary criteria to mitigate the detection problems.

(l) Systems designed using Performance Based criteria shall be identified and referenced to design guides or standards approved by the local authority having jurisdiction consistent with standards adopted by the Florida Fire Prevention Code and the Florida Building Code (2007).

(m) The system design must indicate if the system is to provide a general evacuation signal or a zoned evacuation for all high-rise buildings or multi-tenanted properties as defined in the Florida Building Code (2007).

(n) Wiring requirements for underground, wet locations, campus style wiring, protection against damage and burial depth shall be specified or indicated on the engineering design documents.

(o) Requirements for operations and maintenance procedures, manuals, system documentation, and instruction of Owner's operating personnel, as needed to operate the systems as intended over time.

(5) In the event that the Engineer of Record elects to specify specific equipment and to show the required wiring, battery and voltage drop (circuit analysis) calculations shall be completed. The calculations shall be completed using the equipment manufacture's data and applicable NFPA 72 procedures.

(6) System test requirements shall be noted on the Engineering Design Documents.

(7) When the engineer determines that special requirements are required by the owner, insurance underwriter or local fire code amendments these requirements shall be documented or referenced on the Engineering Design Documents.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.033 FS. History–New 5-19-93, Formerly 21H-32.008, Amended 3-26-09.

61G15-32.009 Design of Fine Water Spray (Mist) Fire Suppression and Control Systems.

(1) Fine water spray (mist) systems include water based fire suppression and control systems based on NFPA 750.

(2) The fire protection system(s) shall be based on applicable NFPA standards when available or on alternative engineering sources including full scale fire testing and good engineering practice when no applicable standard exists.

(3) Design of fine water spray systems requires specific knowledge of hazards, physical containment and fire dynamics. A "pre-engineered" listed system shall be installed only after the engineer of record has evaluated the project specific protected hazard.

Rulemaking Authority 471.008, 471.033(2) FS. Law Implemented 471.005(6), 471.033(2) FS. History–New 4-2-00.

Part III

Course Exam

Chapter 9, Florida Building Code-Building, 5th Edition, (2014)

Fire Protection Systems Examination

1. Exception(s) to the requirement for monitoring a fire alarm system by an approved supervising station include:
   a. single and multiple station smoke alarms
   b. smoke detectors in Group I-3 occupancies
   c. automatic sprinkler systems in one and two family dwellings
   d. all of the above (Section 901.6.2)

2. An existing educational building is being remodeled. Which of the following statements is valid?
   a. an automatic sprinkler system is not required
   b. an automatic sprinkler system is required if the fire area exceeds, 12,000 sq. ft.
   c. an automatic sprinkler system is not required unless 50% of the aggregate area of the building is being remodeled (Section 903.2.3,)
   d. an automatic sprinkler system is required

3 Which of the following conditions in buildings Group F-1 occupancies mandates an automatic sprinkler system?
   a. A Group F-1 fire area containing 10,000 square feet
   b. A Group F-1 fire area located two stories above grade plane
   c. The combined area of all Group F-1 fire areas on all floors including mezzanines exceed 24,000 square feet (Section 903.2.4.)
   d. None of the above

4. A condition that does not affect the requirement for an automatic sprinkler system is:
   a. Building occupancy
   b. Fire area
   c. Occupant load
   d. Type of construction (Section 903.2.1 through 903.2.12,)

5. The maximum number of sprinklers required to be calculated in corridors of buildings containing Group H-5 occupancies, where the corridor is protected by one row of sprinklers is:
   a. 13 (Section 903.2.5.2)
   b. There is no maximum
   c. 15
   d. 10

6. Automatic sprinkler systems installed in rubbish and linen chutes of multi-story buildings shall have sprinkler heads installed in such chutes at:
   a. Each floor
   b. Alternate floors
   c. At the top and terminal room
   d. both b and c above Section 903.2.11.2)

7. Where an automatic sprinkler system is served by a secondary water supply it shall have a duration of not less than:
   a. one hour
   b. 30 minutes (Section 903.3.5.2)
   c. two hours
   d. four hours

8. Audible alarm devices connected to automatic sprinkler systems shall be activated:
   a. by heat
   b. by water flow (Section 903.4.2)
   c. manually
   d. by fire command center

9. Automatic fire extinguishing systems installed as an alternative to automatic sprinkler systems:
   a. shall be approved by the fire code official (Section 904.2)
   b. are considered to be alternatives for the purpose of exceptions or reductions allowed by other requirements of the code.
   c. shall be activated by water pressure
   d. none of the above

10. The actuation of an automatic fire extinguishing system protecting a commercial cooking system shall:
   a. close dampers in the ventilating duct (s)
   b. activate an audible alarm
   c. automatically shut down the fuel or electrical power supply to the cooking equipment (Section 904.11.2,)
   d. all of the above

11. In mall buildings, hose connections shall be provided so that the distance to reach all portions of a tenant space does not exceed:
    a. 150 feet
    b. 200 feet (Section 905.3.3)
    c. 100 feet
    d. as determined by the fire code official

12. Fire resistance-rated protection of risers and laterals of Class II standpipe systems:
    a. shall be equal to that required for vertical enclosures in the building in which they are located.
    b. shall have a 2 hour fire rating
    c. are not required if the building is equipped with an automatic sprinkler system.
    d. is not required (Section 905.5.2)

13. The maximum allowable floor area (coverage) for a portable fire extinguisher installed in an occupancy involving Class A fire hazards that are deemed ordinary (moderate) is:
    a. 3000 sq. ft
    b. 1500 sq. ft. Table 906.3(1)
    c. 1000 sq. ft.
    d. 11, 250 sq. ft

14. Construction documents for fire alarm systems shall indicate:
    a. The location of the initiating devices
    b. Locations of alarm notification appliances
    c. The location of the fire alarm control unit
    d. The location, nature and extent of the work proposed and show in detail that it will conform to the FBC and other applicable codes and regulations. (Section 907.1.1)

15. As a general rule, manual fire alarm boxes are not required in buildings if they are:
    a. equipped with an automatic sprinkler system
    b. the occupant notification appliances will activate upon sprinkler waterflow
    c. at least one manual fire alarm box is installed at an approved location
    d. all of the above (Section 907.2 and 907.2.2)

16. A Group B occupancy building is equipped throughout with an automatic sprinkler system and the requisite occupant notification appliances. Manual fire alarm boxes are:
    a. Not required (Section 907.2.2)
    b. Required on each floor
    c. Required at the entry level (s) of the building
    d. Required if the total occupant load is 500 or more

17. The activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, the automatic sprinkler system or other approved detection device in a special amusement building shall automatically:
    a. Cause all fire doors to open
    b. Send an alarm to a central monitoring station
    c. Activate an approved directional exit marking feature (Section 907.2.12.2)
    d. Disconnect external power sources

18. Subject to certain exceptions for special uses, high-rise buildings shall be provided with:
    a. an automatic smoke detection system
    b. a fire department communication system
    c. an emergency voice/alarm communication system
    d. all of the above (Section 907.2.13)

19. Smoke detectors provided in high-rise buildings shall be located:
    a. in each mechanical, electrical, or telephone equipment room which is not provided with sprinkler protection
    b. in each elevator machine room and in elevator lobbies
    c. in atriums connecting more than two stories
    d. both a and b above (Section 907.2.13.1.1)

20. Duct smoke detectors shall be located:
    a. in the main return air and exhaust air plenum of each air conditioning system having a capacity of 2000 cfm or greater
    b. at each connection to a vertical duct or riser serving two or more stores from a return air duct or plenum of an air conditioning system
    c. in each return air riser serving more than 10 air-inlet openings
    d. both a and b above (Section 907.2.13.1.2)

21. Automatic fire detectors shall:
    a. be connected to the building's fire alarm control unit
    b. activate the alarm notification devices or
    c. activate a visible and audible supervisory signal to a constantly attended location
    d. all of the above (Section 907.3)

22. Manual fire alarm boxes shall be located not more than _____ feet from the entrance to each exit.
    a. 5 (Section 907.4.2)
    b. 200
    c. 10
    d. 20

23. Upon activation a fire alarm system shall:
    a. initiate a pre-signal feature
    b. initiate occupant notification (Section 907.5)
    c. sound an audible alarm
    d. activate a visible alarm

24. In high-rise buildings, an emergency voice/alarm communication system shall operate:
    a. Throughout the building (on all floors)
    b. at a minimum, on the alarming floor, the floor above and the floor below (Section 907.5.2.2)
    c. at elevator groups
    d. at exit stairways

25. A Group R-2 occupancy required to have a fire alarm system contains 125 sleeping units. What is the number of visible alarm notification appliances that must be provided?
    a. 12
    b. 14
    c. 25
    d. 125 (Section 907.5.2.3.4)

26. Smoke control systems are intended:
    a. to provide a tenable environment for the evacuation or relocation of building occupants. (Section 909.1)
    b. for preservation of building contents
    c. for timely restoration of operations
    d. for assistance in fire suppression or overhaul activities

27. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of:
    a. 20 minutes
    b. 1.5 times the calculated egress time
    c. either a or b whichever is less (Section 909.4.6)
    d. continuously until manually turned off

28. The preferred method for smoke control in large enclosed volumes, such as atriums or malls is:
    a. passive method
    b. pressurization method
    c. exhaust method (Section 909.8)
    d. airflow design method

29. When completely automatic smoke control systems are required, the automatic-control sequences shall be initiated:
    a. from an appropriately zoned automatic sprinkler system
    b. by manual controls that are readily accessible to the fire department
    c. by smoke detectors required as a result of an engineering analysis
    d. by any of the above methods (Section 909.12.3)

30. The control actions that have the highest priority of any control point within a building are:
    a. auto
    b. on-off
    c. open-close
    d. both b and c (Section 909.16.3)

31. Smoke control systems shall be tested by:
    a. the design professional
    b. a special inspector (Section 909.18.8)
    c. The building official
    d. the fire department

32. Doors in a smoke proof enclosure shall be self or automatic closing by actuation of a smoke detector. The activation of the smoke detector on any door shall activate:
    a. The closing devices on all doors in the smoke proof enclosure at the level on which the actuation occurred.
    b. The closing devices on all doors in the smoke proof enclosure at all levels (Section 909.20.2.1)
    c. The alarm at the fire control center
    d. the vestibule doors at all levels

33. Where elevator hoistway pressurization is provided in lieu of enclosed elevator lobbies, the hoistways shall be pressurized to maintain a minimum positive pressure of:
    a. 0.25 inches of water
    b. at the discretion of the design professional
    c. 0.10 inches of water (Section 909.21.1)
    d. as required by the building official

34. The elevator pressurization system shall be activated:
    a. upon activation of the building fire alarm system
    b. upon activation of the elevator lobby smoke detectors
    c. either a or b above (Section 909.21.6)
    d. at the fire control center

35. Smoke and heat vents shall be located a minimum of _____ feet from adjacent lot lines.
    a. 10
    b. 20 (Section 910.3.4)
    c. 5
    d. Depends on the zoning classification

36. Mechanical smoke exhaust fans shall be activated by:
    a. the automatic sprinkler system
    b. heat detectors
    c. manually, at the fire command center
    d. either a or b (Section 910.4.3)

37. Fire command centers shall be separated from the remainder of the building in which they are located by:
    a. A 4-hour fire barrier
    b. A 2-hour fire barrier
    c. A 1-hour fire barrier (Section 911.1.2)
    d. No fire barrier is required if the building has an automatic sprinkler system

38. A new requirement for fire command centers in the 2014 Building Code is:
    a. the provision of schematic building plans
    b. the provision of an approved Building Information Card that contains general building information (Section 911.1.5 (13)
    c. an emergency voice/alarm communication system control unit
    d. the fire department communications system

39. An automatic sprinkler system is usually activated by
    a. by heat (Section 202 Definitions)
    b. by smoke
    c. by water pressure
    d. manually

40. A facility that receives signals and at which personnel are in attendance at all times respond to the signal is known as:
    a. A fire command center
    b. A fire station
    c. A supervising station (Sect 202 Definitions)
    d. A fire control center