Final Draft Proposed Changes to the 2020 Fire Code of New York State
Issued July 2024

This document is being developed for the purpose of posting a notice of rule in development for the New York State Fire Prevention and Building Code Council (Code Council) and the New York State Department of State. The purpose is to show the final draft proposed changes to the current version of the 2020 Fire Code of New York State (2020 FCNYS). Separate documents will exist for each of the current NYS specific code books. This document **is not intended to include** all of the proposed code language; it only contains those sections of code that are proposed to be new or modified. Please note that unaltered portions of the 2020 code books are not included within this document and should be considered to remain the same for this code update.

This document is the final draft of the notice of rule in development being released for comment from the public and the Code Council. Accordingly, the Yellow highlighted text included in earlier versions to denote the changes from earlier versions of the documents has been removed.

Please note:

- Chapter 1's are included as a separate document for all of the code books
- This document does not include grammatical, punctuation, and simple word clarifications that do not change the intent or meaning of a provision.
- Where a change is made by NYS, rather than an ICC level change, "[NY]" is added to the section numbers; however, grammatical and punctuation changes made by NYS that do not change the intent or meaning of a provision are not denoted by [NY]. Similarly, updates made by NYS to cross-referenced sections or sections where the only change is to the referenced code book (i.e. ~~International Plumbing Code~~ Plumbing Code of New York State are not denoted by [NY]).
- Changes to the existing text are denoted in the following manner:
  - Text insertions: TEXT
  - Text deletions: ~~TEXT~~
- Cross-referenced code sections may not be accurate and/or may change based on existing and future modifications. Code sections are based on the anticipated 2024 ICC code section.
- Where multiple code change proposals are listed together, it represents multiple ICC code changes that dealt with the same code sections and were therefore consolidated.
- Some code changes involve complex tables, lists, or lengthy sections in which a small change was made to only a portion of the section. In those instances, the entire section, table, list, etc. that was unchanged may not be included below. A note has been added to indicate when that happens (i.e. "Items 1 through 13 remain unchanged").

Reference to Chapter 11 of the Residential Code of New York State for energy provisions will be corrected in the notice of proposed rule making documents to reference the corresponding provision from the Energy Conservation Construction Code of New York State.

CHAPTER 1 SCOPE AND ADMINISTRATION

See Chapter 1 Documents

CHAPTER 2 DEFINITIONS

[NY] 201.1 Scope. Unless otherwise expressly stated, the ~~following~~ words and terms provided in italics shall, for the purposes of this code, have the meanings indicated in this chapter or as defined within the chapter or appendix where the word or term is found, except as provided in Sections 201.3 and 201.4.

[NY] 201.2 Interchangeability. Words and terms used in the present tense include the future; words and terms stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

[NY] 201.3 ~~Terms~~ Words and terms defined in other codes. Where italicized words and terms are not defined in this code and are defined in the *Building Code of New York State, Fuel Gas Code of New York State, Mechanical Code of New York State, or Plumbing Code of New York State,* such terms shall have the meanings ascribed to them in those codes.

[NY] 201.4 ~~Terms~~ Words and terms not defined. Where words and terms are not italicized or are italicized but not defined through the methods authorized in this section, such words and terms shall have the meanings defined in applicable referenced standards, statutes, or regulations or shall have the ordinarily accepted meanings such as the context implies. *Merriam Webster's Collegiate Dictionary, 11th Edition*, shall be considered as providing ordinarily accepted meanings.

3D PRINTER. A machine used in the *additive manufacturing* process for fabricating objects through the deposition of a material using a print head, nozzle, or another printer technology.

ACTIVE RF EMITTING DEVICE. Any type of circuit component that requires an AC or DC power source with the ability to electrically control electron flow and/or amplification of RF signal, including but not limited to signal boosters, repeaters, bidirectional amplifiers, and fiber-distributed antenna systems.

ADDITIVE MANUFACTURING. A process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. The Code recognizes two types of additive manufacturing:

> **Industrial additive manufacturing.** 3D printing operations that typically utilize combustible powders or metals, an inert gas supply, a *combustible dust* collection system, or that create a hazardous (classified) location area or zone outside the equipment.
>
> **Nonindustrial additive manufacturing.** 3D printing operations that do not create a hazardous (classified) location area outside the equipment and do not utilize an inert gas supply or a *combustible dust* collection system.

[A] APPROVED AGENCY. An established and recognized organization that is regularly engaged in conducting tests, furnishing inspection services or furnishing product evaluation or certification where such organization has been approved by the *fire code official*.

AUTOMATIC FLUSH BOLT. Door locking hardware, installed on the inactive leaf of a pair of doors, which has a bolt that is extended automatically into the door frame or floor when the active leaf is closed after the inactive leaf, and which holds the inactive leaf in a closed position. When the active leaf is opened, the automatic flush bolt retracts the bolt or rod allowing the inactive leaf to be opened (see *CONSTANT LATCHING BOLT, DEAD BOLT, MANUAL BOLT*).

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.~~ An automatic sprinkler system is an integrated network of piping and fire sprinklers designed in accordance with fire protection standards.

BATTERY TYPES.

Flow battery. A type of storage battery that includes chemical components dissolved in two different liquids. Ion exchange, which provides the flow of electrical current, occurs through the membrane while both liquids circulate in their respective spaces.

Lead-acid battery. A storage battery that is comprised of lead electrodes immersed in a solution of water and sulfuric ~~sulphuric~~ acid electrolyte.

Lithium metal polymer battery. A storage battery that is similar to the lithium-ion battery except that it has a lithium metal anode in the place of the traditional carbon or graphite anode**.**

Lithium-ion battery. A storage battery with lithium ions serving as the charge carriers of the battery. The electrolyte is a polymer mixture of carbonates with an inorganic salt and can be in a liquid or a gelled polymer form. Lithiated metal oxide is typically a cathode and forms of carbon or graphite typically form the anode.

Nickel-cadmium (Ni-Cd) battery. An alkaline storage battery in which the positive active material is nickel oxide, the negative contains cadmium and the electrolyte is a solution of water and potassium hydroxide.

Nickel-metal hydride (Ni-MH). An alkaline storage battery in which the positive active material is nickel oxide, the negative electrode is an intermetallic compound and the electrolyte is usually potassium hydroxide

~~Preengineered stationary storage battery system. An energy storage system consisting of batteries, a battery management system, components and modules that are produced in a factory, designed to comprise the system when assembled on the job site~~.

~~**Prepackaged stationary storage battery system.** An energy storage system consisting of batteries, a battery management system, components and modules that is factory assembled and shipped as a complete unit for installation at the job site.~~

Sodium-beta storage battery. A storage battery, also referred to as a Na-beta battery or NBB, which uses a solid beta-alumina electrolyte membrane that selectively allows sodium ion transport between a positive electrode such as metal halide and a negative sodium electrode.

Stationary storage battery. A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load, designed for service in a permanent location.

~~[NY]~~**CAPACITOR ENERGY STORAGE SYSTEM.** A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls and associated electrical equipment designed to provide electrical power to a building or facility. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

CARBON MONOXIDE SOURCE. A combustion process that has the potential to produce carbon monoxide as a product of combustion under normal or abnormal conditions. Carbon monoxide sources include, but are not limited to solid-, liquid-, or gas-fueled appliances, equipment, devices, or systems, such as fireplaces, furnaces, heaters, boilers, cooking equipment, and vehicles with internal combustion engines.

[NY] Carbon Monoxide Source, Direct. A permanently installed carbon monoxide source that is located in an interior space.

[NY] Carbon Monoxide Source, Forced-indirect. A carbon monoxide source connected to an interior space by a forced air supply duct.

COMBUSTIBLE LIQUID. A liquid having a closed cup *flash point* at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:

The category of combustible liquids does not include *compressed gases*, *cryogenic fluids*, or liquids that do not have a fire point when tested in accordance with ASTM D92.

NOTE: Combustible liquid subcategory definitions are unchanged and are omitted for clarity.

COMPUTER ROOM. A room or portions of a *building* used primarily to house *information technology equipment (ITE)* and serving an *ITE* load less than or equal to10 kW or 20 W/ft2 (215 W/m2) or less of conditioned floor area.

CONSTANT LATCHING BOLT. Door locking hardware installed on the inactive leaf of a pair of doors, which has a bolt that automatically latches into the door frame or the floor, and which holds the inactive leaf in a closed position. The latch bolt is retracted manually to allow the inactive leaf to be opened.

CRITICAL AREAS. Areas that are designated for the highest level of emergency responder radio coverage including but not limited to areas such as exit stairs, *exit passageways*, elevator lobbies, fire protection equipment room and control valve locations, and *fire command centers*.

CURRENT TAP. An electrical device that, where connected to a permanently installed receptacle outlet, provides multiple receptacle outlet configurations.

DATA CENTER. A room or *building*, or portions thereof, used primarily to house *information technology equipment (ITE)* and serving a total *ITE* load greater than 10 kW and 20 W/ft^2 (215 W/m^2) of conditioned floor area.

DEAD BOLT. Door locking hardware with a bolt which is extended and retracted by action of the lock mechanism (see "*AUTOMATIC FLUSH BOLT*", "*CONSTANT LATCHING BOLT*", "*MANUAL BOLT*").

DELIVERED AUDIO QUALITY (DAQ). A measure of audio quality over a transmission medium. This metric is often used to quantify the quality of audio heard over a radio system. DAQ levels are defined by the following scale:

DAQ 1 = Unusable. Speech is present but not understandable.

DAQ 2 = Speech is understandable with considerable effort. Requires frequent repetition due to noise or distortion.

DAQ 3 = Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.

DAQ 3.4 = Speech understandable without repetition. Some noise or distortion present.

DAQ 4 = Speech easily understandable. Little noise or distortion. DAQ 5 = Perfect. No distortion or noise discernible.

DAQ 5 = perfect. No distortion or noise discernible.

DOWNLINK. The signal from the base station/tower site to the portable radio or device.

DUST COLLECTION SYSTEM. A combination of equipment designed to contain, capture and collect airborne combustible dusts.

[BE] EMERGENCY ESCAPE AND RESCUE OPENING. An operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency.

EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEM (ERCES). An infrastructure solution installed within a building to enhance the communications capabilities for first responders that utilizes solutions such as a signal booster, voting receiver, base station, or other technology capable of enhancing the radio frequency (RF) to ensure effective public safety communications.

~~[NY]~~ **ENERGY STORAGE MANAGEMENT SYSTEMS.** An electronic system that protects energy storage systems from operating outside their safe operating parameters, and disconnects electrical power to the ESS or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.

~~[NY]~~ **ENERGY STORAGE SYSTEM (ESS).** One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time~~, not to include a stand-alone 12-volt car battery or an electric motor vehicle~~.

~~[NY]~~ **ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.** An energy storage system that stores energy and produces electricity using chemical reactions. It includes, among others, battery ESS and capacitor ~~energy storage systems~~ ESS.

~~[NY]~~ **ENERGY STORAGE SYSTEM, MOBILE.** An energy storage system capable of being moved and utilized for temporary energy storage applications, and not installed as fixed or stationary electrical equipment. The system can include integral wheels for transportation or be loaded on a trailer and unloaded for charging, storage and deployment.

~~[NY]~~ **ENERGY STORAGE SYSTEM, STATIONARY.** An energy storage system installed as fixed or stationary electrical equipment in a permanent location.

[NY] WALK-IN **ENERGY STORAGE SYSTEM, WALK-IN UNIT.** A pre-fabricated building that contains energy storage systems. It includes doors that provide walk-in access for personnel to maintain, test and service the equipment, and is typically used in outdoor and mobile energy storage system ESS applications.

[NY] **ENERGY STORAGE SYSTEM CABINET.** A cabinet An enclosure containing components of the an *energy storage system* and meeting the applicable requirements of that is included in the UL 9540 listing for the system. Personnel are not able to enter the enclosure other than reaching in to access components for maintenance purposes.

[NY] **ENERGY STORAGE SYSTEM COMMISSIONING.** A systematic process that provides documented confirmation that an *energy storage system* functions according to the intended design criteria and complies with applicable code requirements.

[NY] **ENERGY STORAGE SYSTEM DECOMMISSIONING.** A systematic process that provides documentation and procedures that allow an *energy storage system* to be safely de-energized, disassembled, readied for shipment or storage, and removed from the premise in accordance with applicable code requirements.

FLAMMABLE GAS. A material that has a boiling point of 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)] which subdivided as follows:

1. Is Category 1A. A gas which meets either of the following:

1.1. iIgnitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or has

1.2. a A flammable range at 14.7 psia (101 kPa) with air of not less than 12 percent, regardless of the lower limit. unless data shows compliance with Category 1B.

2. Category 1B. A gas which meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one of more of the following:

2.1. A lower flammability limit of more than 6% by volume of air.

2.2. A fundamental burning velocity of less than 3.9 in/s (99 mm/s).

The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.

Where not otherwise specified, the term "flammable gas" includes both Category 1A and 1B.

FLAMMABLE LIQUID. A liquid having a closed cup *flash point* below 100°F (38°C). *Flammable liquids* are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

The category of *flammable liquid*s does not include *compressed gases* or *cryogenic fluids*, or liquids that do not have a fire point when tested in accordance with ASTM D92.

Class IA. Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).

Class IB. Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).

Class IC. Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).

FREQUENCY. The particular waveband at which a communications system broadcasts or transmits.

FREQUENCY LICENSE HOLDER(S). The person(s) or entity(s) that is issued the license from the frequency licensing authority of the United States or other country of jurisdiction for the frequencies being used by both the in-building emergency responder communications enhancement system and the emergency services communications system that it enhances.

FREQUENCY LICENSING AUTHORITY. The government authority in a country or territory that issues frequency licenses for the use of communications frequencies by authorized entities and individuals.

[BS] GYPSUM BOARD. A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing. Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board or water resistant gypsum backing board complying with the standards listed in Tables 2506.2 and 2507.2 and Chapter 35 of the International Building Code.

[NY] GYPSUM PANEL PRODUCT. The general name for a family of sheet products consisting essentially of gypsum complying with the standards specified in Table 2506.2 and Table 2507.2, and Chapter 35 of the International Building Code.

GYPSUM WALLBOARD. A gypsum board used primarily as an interior surfacing for building structures.

[NY] HISTORIC BUILDING. ~~**Any**~~ An existing building ~~or structure~~ that ~~is one or more~~ any of the following:

1. Listed, or certified as eligible for listing ~~by the State Historic Preservation Officer or the Keeper of the~~ , in the National Register of Historic Places~~,~~ or in the New York State Register of Historic Places~~, either individually or as a contributing building to a historic district; or~~.

2. Designated as historic under an applicable state or local law~~.~~

3. Certified as a contributing resource within a National Register-listed, State Register-listed, or locally designated historic district.

HYBRID FIRE EXTINGUISHING SYSTEM. A system which utilizes a combination of atomized water and inert gas to extinguish fire.

INFLATABLE AMUSEMENT DEVICE. A device made of flexible fabric or other combustible materials that is inflated by one or more air-blowers providing internal air pressure to maintain its shape. Such devices are typically designed for recreational activities that allow occupants to bounce, climb, slide, negotiate an obstacle course or participate in interactive play.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers, and network communication equipment.

INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). *Data centers* and *computer rooms* used primarily to house *information technology equipment*.

LANDSCAPED ROOF. An area over a roof assembly incorporating planters, vegetation, hardscaping, or other similar decorative appurtenances that are not part of the roof assembly.

LIFE SAFETY SYSTEMS. Systems, devices, and equipment that enhance or facilitate evacuation, smoke control, compartmentation, and/or isolation.

[A] LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the fire code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Terms that are used to identify listed equipment, products or materials include "listed," "certified," "classified" or other terms as determined appropriate by the listing organization.

[NY] LIVE FIRE TRAINING BUILDING. A *building* in which live fire training, fire, rescue, hazmat, and/or other related training evolutions are conducted on a repetitive basis. This shall include, but not be limited to, containerized training structures, live fire training structures, and training towers, as defined in NFPA 1402. ~~As defined by NFPA 1402, fire service training centers, fire training structures and props, gas-fueled and flammable liquid-fueled live fire training systems, mobile fire training props, and associated training props.~~

MANUAL BOLT. Door locking hardware operable from one side of the door, or from the edge of a door leaf, with a bolt or rod extended and retracted by manual movement of the bolt or rod, such as a manual flush bolt or manual surface bolt (see "*AUTOMATIC FLUSH BOLT*", "*CONSTANT LATCHING BOLT*", "*DEAD BOLT*").

[NY] MECHANICAL-ACCESS ENCLOSED PARKING GARAGE. An enclosed parking garage, which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay.

OCCUPANCY CLASSIFICATION. ~~For the purposes of this code, certain occupancies are defined as follows:~~

~~**[BG] Group A, Assembly** Assembly~~ …

OCCUPIABLE ROOF. An exterior space on a roof that is designed for human occupancy, other than maintenance or repair, and which is equipped with a *means of egress* system meeting the requirements of this code.

PASSIVE RF EMITTING DEVICE. A device that does not require an external AC or DC source of power for its operation, and does not provide amplification of the RF signal including but not limited to coax, couplers, splitters and passive antennas.

[A] PEER REVIEW. An independent and objective technical review conducted by an *approved* third party.

PORTABLE GENERATOR. A mobile internal combustion engine-driven device that provides temporary electrical power. This includes hand portable, wheeled, trailer mounted, and motor vehicle mounted generator sets. It does not include generators in permanent, fixed installations.

POWERED MICROMOBILITY DEVICES. Motorized bicycles, motorized scooters and other personal mobility devices powered by a lithium-ion or lithium metal battery. The term does not include motor vehicles that are required to be registered with the Department of Motor Vehicles for the state or jurisdiction.

PUZZLE ROOM. A puzzle room is a type of special amusement area in which occupants are encouraged to solve a challenge to escape from a room or series of rooms. A puzzle room is sometimes referred to as an escape room.

RF RADIO FREQUENCY(RF). A measurement representing the oscillation rate of electromagnetic radiation spectrum, or electromagnetic radio waves, from Public Safety *frequency* bands as specified by the *fire code official*.

REFRIGERANT. The fluid used for heat transfer in a refrigeration system~~; the refrigerant~~ that undergoes a change of state to absorb heat.

[M] ~~REFRIGERATING (~~REFRIGERATION~~)~~ SYSTEM. A combination of interconnected ~~refrigerant-containing~~ parts in which a refrigerant is enclosed and ~~constituting one closed refrigerant circuit in which a refrigerant~~ is circulated for the purpose of extracting then rejecting heat.

RELOCATABLE POWER TAP. A relocatable electrical enclosure that provides one or more receptacle outlets and that is provided with an attached power supply cord and attachment plug for connection to a permanently installed receptacle outlet (also called a “multiplug adaptor”).

SITE SAFETY PLAN. A plan developed to establish a fire prevention program at a construction site.

~~**SPECIAL AMUSEMENT BUILDING.** A building that is temporary, permanent or mobile that contains a device or system that conveys passengers or provides a walkway along, around or over a course in any direction as a form of amusement arranged so that the egress path is not readily apparent due to visual or audio distractions or an intentionally confounded egress path, or is not readily available because of the mode of conveyance through the building or structure.~~

SPECIAL AMUSEMENT AREA. A temporary or permanent building or portion thereof that is occupied for amusement, entertainment or educational purposes and is arranged in a manner that meets one or more of the following descriptions:

1. Makes the *means of egress* path not readily apparent due to visual or audio distractions.
2. Intentionally confounds identification of the *means of egress path*.
3. Otherwise makes the *means of egress* path not readily available because of the nature of the attraction or mode of conveyance through the building or structure.

SPRINKLER EXPRESS RISER. A vertical pipe used to supply water to sprinkler systems in a multiple story building.

~~**STATIONARY BATTERY ARRAY.** An arrangement of individual stationary storage batteries in close proximity to each other, mounted on storage racks or in modules, battery cabinets or other enclosures.~~

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

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

SUPERVISORY SIGNAL-INITIATING DEVICE. An initiating 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~~ protection systems or equipment, or maintenance features of related systems.

TANK, MOTOR VEHICLE FUEL. A tank permanently mounted on a motor vehicle to store a gas or liquid fuel which is used for propulsion.

[A] TOWNHOUSE. A building that contains three or more attached *townhouse units*.

[A] ATOWNHOUSE UNIT. A single-family *dwelling unit* in a *townhouse* that extends from the foundation to the roof and has a yard or public way on not fewer than two sides.

[NY] TYPE X. A type of gypsum panel product with special core additives to increase the fire resistance as specified by the applicable standards listed in Table 2506.2. (See the definition of 'Gypsum panel product')

UPLINK. The signal from the portable to the base station/tower site.

VALET TRASH COLLECTION. An intermediary service that removes trash or recycling materials placed outside of *dwelling units* or *sleeping units* for final collection.

VEGETATIVE ROOF. A roof assembly of interacting components designed to waterproof a building's top surface that includes, by design, a vegetative surface.

VERTICAL WATER SUPPLY ZONE. A vertical fire protection zone within the standpipe system or group of floors supplied by a single sprinkler express riser in a high-rise building established by pressure limitations based on the design.

SECTION 203 OCCUPANCY CLASSIFICATION AND USE.

[BG] 203.1 Occupancy classification. Occupancy classification is the formal designation of the primary purpose of the building, structure or portion thereof. Structures shall be classified into one or more of the occupancy groups specified in this section based on the nature of the hazards and risks to building occupants generally associated with the intended purpose of the building or structure. An area, room or space that is intended to be occupied at different times for different purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508 of the *International Building Code*. Where a structure is proposed for a purpose that is not specified in this section, such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupiable roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard, and shall comply with Section 503.1.4 of the *International Building Code*.

1. Assembly: Groups A-1, A-2, A-3, A-4 and A-5.
2. Business: Group B.
3. Educational: Group E.
4. Factory and Industrial: Groups F-1 and F-2.
5. High Hazard: Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional: Groups I-1, I-2, I-3 and I-4.
7. Mercantile: Group M.
8. Residential: Groups R-1, R-2, R-3 and R-4.
9. Storage: Groups S-1 and S-2.
10. Utility and Miscellaneous: Group U.

[BG] 203.1.1 Use designation. Occupancy groups contain subordinate uses having similar hazards and risks to building occupants. Uses include, but are not limited to, those functional designations specified within the occupancy group descriptions in Section 203.1. Certain uses require specific limitations and controls in accordance with the provisions of this code and Chapter 4 of the *International Building Code*.

Note: The following existing language was moved from the definitions section (under Occupancy Classification) to this new section 203.

[BG] 203.2 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

[BG] **203.2.1 Small buildings and tenant spaces.** A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

[BG] 203.2.2 Small assembly spaces. The following rooms and spaces shall not be classified as Assembly occupancies:

1. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

2. A room or space used for assembly purposes that is less than 750 square feet (70 m2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

[BG] 203.2.3 Associated with Group E occupancies. A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

[BG] 203.2.4 Accessory to places of religious worship. Accessory religious educational rooms and religious auditoriums with *occupant loads* of less than 100 per room or space are not considered separate occupancies.

[BG] 203.2.5 Special Amusement Areas. Special amusement areas shall comply with Section 411 of the *International Building Code.*

[BG] 203.2.5 Assembly Group A-1. Group A-1 occupancy includes assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

Motion picture theaters

Symphony and concert halls

Television and radio studios admitting an audience

Theaters

[BG] 203.2.6 Assembly Group A-2. Group A-2 occupancy includes assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls

Casinos (gaming areas)

Nightclubs

Restaurants, cafeterias and similar dining facilities (including associated commercial kitchens)

Taverns and bars

[BG] 203.2.7 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades

Art galleries

Bowling alleys

Community halls

Courtrooms

Dance halls (not including food or drink consumption)

Exhibition halls

Funeral parlors

Greenhouses ~~with public access~~ for the conservation and exhibition of plants that provide public access

Gymnasiums (without spectator seating)

Indoor swimming pools (without spectator seating)

Indoor tennis courts (without spectator seating)

Lecture halls

Libraries

Museums

Places of religious worship

Pool and billiard parlors

Waiting areas in transportation terminals

[BG] 203.2.8 Assembly Group A-4. Group A-4 occupancy includes assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

Arenas

Skating rinks

Swimming pools

Tennis courts

[BG] 203.2.9 Assembly Group A-5. Group A-5 occupancy includes assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

Amusement park structures

Bleachers

Grandstands

Stadiums

[BG] 203.3 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers

Ambulatory care facilities

Animal hospitals, kennels and pounds

Banks

Barber and beauty shops

Car wash

Civic administration

Clinic-outpatient

Dry cleaning and laundries: pick-up and delivery stations and self-service

Educational occupancies for students above the 12th grade, including higher education laboratories.

Electronic data ~~processing~~ entry

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m2) in area.

Laboratories: testing and research

Lithium-ion or lithium metal battery testing, research and development

Motor vehicle showrooms

Post offices

Print shops

Professional services (architects, attorneys, dentists, physicians, engineers, etc.)

Radio and television stations

Telephone exchanges

Training and skill development not in a school or academic program (This shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).

[BG] 203.3.1 Airport traffic control towers. Airport traffic control towers shall comply with Section 412.2 of the *International Building Code*.

[BG] 203.3.2 Ambulatory care facilities. Ambulatory care facilities shall comply with Section 422 of the *International Building Code*.

[BG] 203.3.3 Higher education laboratories. Higher education laboratories shall comply with Section 428 of the *International Building Code*.

[BG] 203.4 Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

[BG] 203.4.1 Accessory to places of religious worship. Religious educational rooms and religious auditoriums, which are accessory to places of religious worship in accordance with Section 303.1.4 of the *International Building Code* and have *occupant loads* of less than 100 per room or space shall be classified as Group A-3 occupancies.

[BG] 203.4.2 Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 21/2 years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

[BG] 203.4.2.1 Within places of religious worship. Rooms and spaces within *places of religious worship* providing such day care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.4.2.2 Five or fewer children. A facility having five or fewer children receiving such day care shall be classified as part of the primary occupancy.

[BG] 203.4.2.3 Five or fewer children in a dwelling unit. A facility such as the above within a *dwelling unit* and having five or fewer children receiving such day care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] 203.4.3 Storm shelters in Group E occupancies. Storm shelters shall be provided for Group E occupancies where required by Section 423.4 of the *International Building Code*.

[BG] 203.5 Factory Industrial Group F. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

[BG] 203.5.1 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)

Appliances

Athletic equipment

Automobiles and other motor vehicles

Bakeries

Beverages: over ~~16~~20-percent alcohol content

Bicycles

Boats

Brooms or brushes

Business machines

Cameras and photo equipment

Canvas or similar fabric

Carpets and rugs (includes cleaning)

Clothing

Construction and agricultural machinery

Disinfectants

Dry cleaning and dyeing

Electric generation plants

Electronics

Energy storage systems (ESS) in dedicated use buildings

Energy storage systems (ESS) and equipment containing lithium-ion or lithium metal batteries

Engines (including rebuilding)

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities more than 2,500 square feet (232 m2) in area

Furniture

Hemp products

Jute products

Laundries

Leather products

Lithium-ion batteries

Machinery

Metals

Millwork (sash and door)

Motion pictures and television filming (without spectators)

Musical instruments

Optical goods

Paper mills or products

Photographic film

Plastic products

Printing or publishing

Recreational vehicles

Refuse incineration

Shoes

Soaps and detergents

Textiles

Tobacco

Trailers

Upholstering

Vehicles powered by lithium-ion or lithium metal batteries

Water/sewer treatment facilities

Wood; distillation

Woodworking (cabinet)

[BG] 203.5.1.1 Aircraft manufacturing facilities. Aircraft manufacturing facilities shall comply with Section 412.6 of the *International Building Code.*

[BG] 203.5.2 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials that during finishing, packing or processing does not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

Beverages: up to and including ~~16~~ 20-percent alcohol content

Brick and masonry

Ceramic products

Foundries

Glass products

Gypsum

Ice

Metal products (fabrication and assembly)

[BG] 203.6 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or *health hazard* in quantities in excess of those allowed in *control areas* complying with Section 5003.8.3, based on the maximum allowable quantity limits for *control areas* set forth in Tables 5003.1.1(1) and 5003.1.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this code and the requirements of Section 415 of the *International Building Code*. Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with this code.

~~**[BG]**~~ **203.6.1** ~~**Uses other than Group H**~~ **Occupancy exemptions.** Storage. use and handling of hazardous materials in accordance with Table 307.1.1 of the *International Building Code* shall not be counted as contributing to maximum allowable quantities and shall not cause classification of an occupancy to be Group H. Such storage, use and handling shall comply with applicable provisions of this code. ~~The storage, use or handling of hazardous materials as described in one or more of the following items shall not cause the occupancy to be classified as Group H, but it shall be classified as the occupancy that it most nearly resembles:~~

Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Chapter 24 of this code and Section 416 of the International Building Code.

Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to Chapter 57.

Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.

Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers in accordance with Section 707 of the International Building Code or 1-hour horizontal assemblies in accordance with Section 711 of the International Building Code, or both.

Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).

Liquor stores and distributors without bulk storage.

Refrigeration systems.

The storage or utilization of materials for agricultural purposes on the premises.

Stationary storage battery systems installed in accordance with Section 1206.15.

Corrosive personal or household products in their original packaging used in retail display.

Commonly used corrosive building materials.

Buildings and structures occupied for aerosol product storage shall be classified as Group S-1, provided that such buildings conform to the requirements of Chapter 51.

Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 5003.8.3.5.1.

The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements of this code.

Stationary fuel cell power systems installed in accordance with this code.

Capacitor energy storage systems in accordance with this code.

Group B higher education laboratory occupancies complying with Section 428 of the International Building Code and Chapter 38 of this code.

[BG] 203.6.2 Hazardous materials. Hazardous materials in any quantity shall conform to the requirements of this code, and Section 414 of the *International Building Code*.

[BG] 203.6.3 High-hazard Group H-1. Buildings and structures containing materials that pose a *detonation hazard* shall be classified as Group H- 1. Such materials shall include, but not be limited to, the following:

Detonable *pyrophoric* materials

Explosives:

Division 1.1

Division 1.2

Division 1.3

Division 1.4

Division 1.5

Division 1.6

Organic peroxides, unclassified detonable

Oxidizers, Class 4

Unstable (reactive) materials, Class 3 detonable and Class 4

[BG] 203.6.3.1 Occupancies containing explosives not classified as H-1. The following occupancies containing *explosive materials* shall be classified as follows:

1. Division 1.3 *explosive materials* that are used and maintained in a form where either confinement or configuration will not elevate the hazard from a mass fire to mass explosion hazard shall be allowed in Group H-2 occupancies.
2. Division 1.4 *explosive materials* shall be allowed in Group H-3 occupancies.
3. Articles, including articles packaged for shipment, that are not regulated as a Division 1.4 *explosive* under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a *detonation* or *deflagration* between articles shall be allowed in H-3 occupancies.

[BG] 203.6.4 High-hazard Group H-2. Buildings and structures containing materials that pose a *deflagration* hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or *combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*

Cryogenic fluids, flammable

Category 1A flammable gases

Category 1B flammable gases having a burning velocity greater than 3.9 inches per second (99 mm/s)

~~Flammable gases~~

Organic peroxides, Class I

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa)

Pyrophoric liquids, solids and gases, nondetonable

Unstable (reactive) materials, Class 3, nondetonable

Water-reactive materials, Class 3

[BG] 203.6.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less

Combustible fibers, other than densely packed baled cotton, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3 of the *International Building Code*

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Category 1B flammable gases having a burning velocity of 3.9 inches per second (10 cm/s) or less

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

[BG] 203.6.6 High-hazard Group H-4. Buildings and structures containing materials that are health hazards shall be classified as Group H-4. Such materials shall include, but not be limited to, the following:

Corrosives

Highly toxic materials

Toxic materials

[BG] 203.6.7 **High-hazard Group H-5.** Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used and the aggregate quantity of materials is in excess of those specified in Tables 5003.1.1(1) and 5003.1.1(2) shall be classified as Group H-5. Such facilities and areas shall be designed and constructed in accordance with Section 415.11 of the *International Building Code*.

[BG] 203.6.8 Multiple hazards. Buildings and structures containing a material or materials representing hazards that are classified in one or more of Groups H-1, H-2, H-3 and H-4 shall conform to the code requirements for each of the occupancies so classified.

[BG] 203.7 **Institutional Group I.** Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are incapable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

[BG] 203.7.1 Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive *custodial care*. Buildings of Group I-1 shall be classified as one of the occupancy conditions ~~indicated below~~ specified in Section 203.7.1.1 or 203.7.1.2 and shall comply with Section 420 of the *International Building Code*. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Residential board and custodial care facilities

Social rehabilitation facilities

[BG] 203.7.1.1 **Condition 1.** This occupancy condition shall include buildings in which all persons receiving *custodial care* who, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.2 **Condition 2.** This occupancy condition shall include buildings in which there are any persons receiving *custodial care* who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.7.1.3 **Six to 16 persons receiving custodial care.** A facility housing not fewer than six and not more than 16 persons receiving *custodial care* shall be classified as Group R-4.

[BG] 203.7.1.4 **Five or fewer persons receiving custodial care.** A facility with five or fewer persons receiving *custodial care* shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code.*

[BG] 203.7.2 **Institutional Group I-2.** Institutional Group I-2 occupancy shall include buildings and structures used for medical care on a 24-hour basis for more than five persons who are incapable of self-preservation. This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Psychiatric hospitals

[BG] 203.7.2.1 Occupancy Conditions. Buildings of Group I-2 shall be classified as one of the ~~following~~ occupancy conditions specified in Sections 203.7.2.1.1 and 203.7.2.1.2 and shall comply with Section 407 of the *International Building Code*.

[BG] 203.7.2.1.1 **Condition 1.** This occupancy condition shall include facilities that provide nursing and medical care but do not provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to nursing homes and foster care facilities.

[BG] 203.7.2.1.2 **Condition 2.** This occupancy condition shall include facilities that provide nursing and medical care and could provide emergency care, surgery, obstetrics or in-patient stabilization units for psychiatric or detoxification, including but not limited to hospitals.

[BG] 203.7.2.2 **Five or fewer persons receiving medical care.** A facility with five or fewer persons receiving medical care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or Section P2904 of the *International Residential Code*.

[BG] 203.7.3 **Institutional Group I-3.** Institutional Group I-3 occupancy shall include buildings and structures which are inhabited by more than five persons who are under restraint or security. A Group I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control. This group shall include, but not be limited to, the following:

Correctional centers

Detention centers

Jails

Prerelease centers

Prisons

Reformatories

Buildings of Group I-3 shall be classified as one of the ~~following~~ occupancy conditions specified in Sections 203.7.3.1 through 203.7.3.5 and shall comply with Section 408 of the *International Building Code*.

[BG] 203.7.3.1 **Condition 1.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and other spaces where access or occupancy is permitted to the exterior via *means of egress* without restraint. A Condition 1 facility is permitted to be constructed as Group R.

[BG] 203.7.3.2 **Condition 2.** This occupancy condition shall include buildings in which free movement is allowed from sleeping areas and any other occupied *smoke compartment* to one or more other *smoke compartments*. Egress to the exterior is impeded by locked exits.

[BG] 203.7.3.3 **Condition 3.** This occupancy condition shall include buildings in which free movement is allowed within individual *smoke compartments*, such as within a residential unit comprised of individual *sleeping units* and group activity spaces, where egress is impeded by remote-controlled release of *means of egress* from such *smoke compartment* to another *smoke compartment*.

[BG] 203.7.3.4 **Condition 4.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Remote-controlled release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] 203.7.3.5 **Condition 5.** This occupancy condition shall include buildings in which free movement is restricted from an occupied space. Staff-controlled manual release is provided to permit movement from *sleeping units*, activity spaces and other occupied areas within the *smoke compartment* to other *smoke compartments*.

[BG] 203.7.4 **Institutional Group I-4, day care facilities.** Institutional Group I-4 shall include buildings and structures occupied by more than five persons of any age who receive *custodial care* for less than 24 hours by persons other than parents or guardians, relatives by blood, marriage, or adoption, and in a place other than the home of the person cared for. This group shall include, but not be limited to, the following:

Adult day care

Child day care

[BG] 203.7.4.1 Classification as Group E. A child day care facility that provides care for more than five but not more than 100 children 2 1/2 years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms have an exit door directly to the exterior, shall be classified as Group E.

[BG] 203.7.4.2 Within a place of religious worship. Rooms and spaces within *places of religious worship* providing such care during religious functions shall be classified as part of the primary occupancy.

[BG] 203.7.4.3 Five or fewer persons receiving care. A facility having five or fewer persons receiving *custodial care* shall be classified as part of the primary occupancy.

[BG] 203.7.4.4 Five or fewer persons receiving care in a dwelling unit. A facility such as the above within a dwelling unit and having five or fewer persons receiving *custodial care* shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code*.

[BG] 203.8 Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and where the public has access. Mercantile occupancies shall include, but not be limited to, the following:

Department stores

Drug stores

Greenhouses with public access that maintain plants for display and sale

Markets

Motor fuel-dispensing facilities

Retail or wholesale stores

Sales rooms

[BG] 203.8.1 Quantity of hazardous materials. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored or displayed in a single *control area* of a Group M occupancy shall not exceed the quantities in Table 5704.3.4.1.

[BG] 203.8.2 Motor fuel-dispensing facilities. Motor fuel-dispensing facilities shall comply with Section 406.7 of the *International Building Code.*

[BG] 203.9 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2 of the *International Building Code*. Group R occupancies not constructed in accordance with the *International Residential Code* as permitted by Sections 310.4.1 and 310.4.2 of the *International Building Code* shall comply with Section 420 of the *International Building Code*.

[BG] **203.9.1** Residential Group R-1. Residential Group R-1 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants

Congregate living facilities (transient) with more than 10 occupants

Hotels (transient)

Motels (transient)

Lodging houses with more than five guestrooms

[BG] 203.9.2 Residential Group R-2. Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses

Congregate living facilities (non-transient) with more than 16 occupants

Boarding houses (non-transient)

Convents

Dormitories

Emergency services living quarters

Fraternities and sororities

Monasteries

Hotels (non-transient) with more than five guestrooms

Live/work units

Motels (non-transient) with more than five guestrooms

Vacation timeshare properties

[BG] 203.9.3 Residential Group R-3. Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units

Care facilities that provide accommodations for five or fewer persons receiving care

Congregate living facilities (non-transient) with 16 or fewer occupants

Boarding houses (non-transient)

Convents

Dormitories

Emergency services living quarters

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses (transient) with five or fewer guestrooms

Hotels (nontransient) with five or fewer guestrooms

Motels (nontransient) with five or fewer guestrooms

[**BG] 203.9.3.1 Care facilities within a dwelling**. Care facilities for five or fewer persons receiving care that are within a single-family *dwelling* are permitted to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 of this code or Section P2904 of the *International Residential Code*.

[BG] 203.9.3.2 Lodging houses. Owner-occupied *lodging houses* with five or fewer *guest rooms* and 10 or fewer total occupants shall be permitted to be constructed in accordance with the *International Residential Code* provided that an *automatic sprinkler system* is installed in accordance with Section P2904 of the *International Residential Code*

[BG] 203.9.4 Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a *24-hour basis* in a supervised residential environment and receive *custodial care*. Buildings of Group R-4 shall be classified as one of the occupancy conditions ~~indicated below~~ specified in Section 203.9.4.1 or 203.9.4.2. Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the *International Building Code*. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities

Congregate care facilities

Group homes

Halfway houses

Residential board and care facilities

Social rehabilitation facilities

[BG] 203.9.4.1 Condition 1. This occupancy condition shall include buildings in which all persons receiving *custodial care*, without any assistance, are capable of responding to an emergency situation to complete building evacuation.

[BG] 203.9.4.2 Condition 2. This occupancy condition shall include buildings in which there are any persons receiving *custodial care* who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.

[BG] 203.10 Storage Group S. Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

[BG] 203.10.1 Accessory storage spaces. A room or space used for storage purposes that is less than 100 square feet (9.3 m2) in area and accessory to another occupancy shall be classified as part of that occupancy.

[BG] 203.10.2 Combustible storage. High-piled stock or rack storage, or attic, under-floor and concealed spaces used for storage of combustible materials, shall be in accordance with Section 413 of the *International Building Code*.

[BG] 203.10.3 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3, aerosol cooking spray, plastic aerosol 3 (PA3)

Aircraft hangar (storage and repair)

Bags: cloth, burlap and paper

Bamboos and rattan

Baskets

Belting: canvas and leather

Beverages over 20-percent alcohol content

Books and paper in rolls or packs

Boots and shoes

Buttons, including cloth covered, pearl or bone

Cardboard and cardboard boxes

Clothing, woolen wearing apparel

Cordage

Dry boat storage (indoor)

Furniture

Furs

Glues, mucilage, pastes and size

Grains

Horns and combs, other than celluloid

Leather

Linoleum

Lithium-ion or lithium metal batteries

Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 5003.1.1(1) (see Section 406.8 of the *International Building Code*)

Photo engravings

Resilient flooring

Self-service storage facility (mini-storage)

Silks

Soaps

Sugar

Tires, bulk storage of

Tobacco, cigars, cigarettes and snuff

Upholstery and mattresses

Vehicle repair garages for vehicles powered by lithium-ion or lithium metal batteries

Wax candles

[BG] 203.10.3.1 Aircraft hangars. Aircraft hangars used for storage or repair shall comply with Section 412.3 of the *International Building Code*.

[BG] 203.10.3.2 Motor vehicle repair garages. Motor vehicle repair garages shall comply with Section 406.8 of the *International Building Code*.

[BG] 203.10.4 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

Asbestos

Beverages up to and including ~~16~~20-percent alcohol ~~in metal, glass or ceramic containers~~

Cement in bags

Chalk and crayons

Dairy products in non-waxed coated paper containers

Dry cell batteries

Electrical coils

Electrical motors

Empty cans

Food products

Foods in noncombustible containers

Fresh fruits and vegetables in non-plastic trays or containers

Frozen foods

Glass

Glass bottles, empty or filled with noncombustible liquids

Gypsum board

Inert pigments

Ivory

Meats

Metal cabinets

Metal desks with plastic tops and trim

Metal parts

Metals

Mirrors

Oil-filled and other types of distribution transformers

Public parking garages, open or enclosed

Porcelain and pottery

Stoves

Talc and soap stones

Washers and dryers

[BG] 203.10.4.1 Public parking garages. Public parking garages shall comply with Section 406.4 of the *International Building Code* and the additional requirements of Section 406.5 of the *International Building Code* for open parking garages or Section 406.6 of the *International Building Code* for enclosed parking garages.

[BG] 203.11 Miscellaneous Group U. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

Agricultural buildings

Aircraft hangar, accessory to a one- or two-family residence (see Section 412.4 of the International Building Code)

Barns

Carports

Communication equipment structures with a gross floor area of less than 1,500 square feet (139 m3)

Fences more than ~~6~~7 feet (~~1829~~2134 mm) in height

Grain silos, accessory to a residential occupancy

Livestock shelters

Private garages

Retaining walls

Sheds

Stables

Tanks

Towers

[BG] 203.11.1 Greenhouses. Greenhouses not classified as another occupancy shall be classified as Use Group U.

[BG] 203.11.2 Private garages and carports. Private garages and carports shall comply with Section 406.3 of the *International Building Code*.

[BG] 203.11.3 Residential aircraft hangars. Aircraft hangars accessory to a one- or two-family residence shall comply with Section 412.4 of the International Building Code.

CHAPTER 3 GENERAL REQUIREMENTS

301.2 Permits. Permits shall be required as set forth in Section 105.5 for the activities or uses regulated by Sections ~~306~~, 307, 308, ~~315~~ ,-and 320.

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

3D PRINTER.

ADDITIVE MANUFACTURING.

BONFIRE.

HI-BOY.

HIGH-VOLTAGE TRANSMISSION LINE.

OPEN BURNING.

PORTABLE OUTDOOR FIREPLACE.

POWERED INDUSTRIAL TRUCK.

RECREATIONAL FIRE.

SKY LANTERN.

VALET TRASH COLLECTION.

304.1 Waste accumulation prohibited. Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

304.1.1 Valet trash. *Valet trash collection* shall only be permitted where *approved*. The *owner* and *valet trash collection* service provider shall comply with the rules and limitations established by the jurisdiction.

~~**304.1.1**~~ **304.1.2 Waste material.** Accumulations of wastepaper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any type shall not be permitted to remain on a roof or in any court, yard, vacant lot, alley, parking lot, open space, or beneath a *grandstand, bleacher*, pier, wharf, manufactured home, recreational vehicle or other similar structure.

[NY] ~~**304.1.2**~~ **304.1.3 Vegetation.** Weeds, grass, vines or other growth that is capable of being ignited and endangering property, shall be cut down and removed by the *owner* or occupant of the premises.

~~**304.1.3**~~ **304.1.4 Space underneath seats.** Spaces underneath *grandstand* and *bleacher* seats shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1-hour *fire-resistance-rated* construction in accordance with the *International Building Code*.

~~**304.1.3.1**~~ **304.1.4.1 Spaces underneath grandstands and bleachers.** Spaces underneath *grandstands* and *bleachers* shall not be occupied or utilized for purposes other than *means of egress* except where equipped with an *automatic sprinkler system* in accordance with Section 903.2.1.5.1, or separated with *fire barriers* and horizontal assemblies in accordance with Section 1030.1.1.1.

304.3 Containers. ~~Combustible~~ Containers for combustible rubbish and waste material ~~kept~~ located within or near a structure shall ~~be stored in accordance~~ comply with Sections 304.3.1 through 304.3. 7~~4~~.

304.3.2 Low heat release materials.

Where required by this section, low heat release materials shall exhibit a peak rate of heat release not exceeding 300 kW/m2 where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

~~**304.3.2**~~ **304.3.3 Capacity exceeding 5.33 cubic feet.** Containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m) shall be provided with lids. Containers and lids shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. ~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m in the horizontal orientation.~~

> ~~**Exception:** Wastebaskets complying with Section 808.~~

304.3.4 Capacity of 1 cubic yard or more. Dumpsters with an individual capacity of 1.0 cubic yard [200 gallons (0.76 m)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the dumpsters are constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2.~~of combustible materials with a peak rate of heat release not exceeding 300 kW/m where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m in the horizontal orientation.~~

Exceptions:

1. Dumpsters in areas protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.

~~304.3.3~~ 304.3.5 **Capacity exceeding 1.5 cubic yards.** Dumpsters and containers with an individual capacity of 1.5 cubic yards [40.5 cubic feet (1.15 m)] or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines.

Exceptions:

1. Dumpsters or containers that are placed inside buildings in areas protected by an approved automatic sprinkler system installed throughout in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage.

3. Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an approved automatic sprinkler system.

304.3.6 Waste and linen containers in Group I-1, I-2, and I-3 occupancies and ambulatory care facilities.

Waste and linen containers located in Group I-1, I-2 and I-3 occupancies and ambulatory care facilities shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. Metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable waste and linen containers exceeding 32 gallons(121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509 of the *International Building Code*.

> **Exception:** Recycling clean waste containers complying with Section 304.3.6.2 are not required to be stored in waste and linen collection rooms.

304.3.6.1 Capacity Density. The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).

304.3.6.2 Recycling clean waste containers. Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

304.3.7 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories.

Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20 gallons (75.7 L) or more, shall be constructed of noncombustible materials or low heat release materials in accordance with Section 304.3.2. Metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room constructed in accordance with Table 509 of the *International Building Code*.

308.1.4 ~~308.1.5~~ **Location near combustibles.** Open flames such as from candles~~,~~ and lanterns~~, kerosene heaters and gas-fired heaters~~ shall not be located on or near decorative material or similar combustible materials.

308.1.5 ~~308.1.6~~ **Open-flame devices in wildfire risk areas.** Torches and other devices, machines or processes liable to start or cause fire shall not be operated or used in or on wildfire risk areas, except by a permit in accordance with Section 105.5 secured from the fire code official.

Exception: Use within inhabited premises or designated campsites that are not less than 30 feet (9144 mm) from grass-, grain-, brush- or forest-covered areas.

308.1.5.1 ~~308.1.6.1~~ **Signals and markers.** Flame-employing devices, such as lanterns or kerosene road flares, shall not be operated or used as a signal or marker in or on wildfire risk areas.

Exception: The proper use of fusees at the scenes of emergencies or as required by standard railroad operating procedures.

308.1.6 ~~308.1.6.2~~ **Portable fueled open-flame devices.** Portable open-flame devices fueled by flammable or combustible gases or liquids shall be enclosed or installed in such a manner as to prevent the flame from contacting combustible material.

Exceptions:

1. LP-gas-fueled devices used for sweating pipe joints or removing paint in accordance with Chapter 61.

2. Cutting and welding operations in accordance with Chapter 35.

3. Torches or flame-producing devices in accordance with Section 308.4.

4. Candles and open-flame decorative devices in accordance with Section 308.3.

308.1.7 ~~308.1.6.3~~ **Sky lanterns.** A person shall not release or cause to be released an untethered sky lantern.

308.1.8 ~~308.1.7~~ **Religious ceremonies**. Where, in the opinion of the *fire code official*, adequate safeguards have been taken, participants in religious ceremonies are allowed to carry hand-held candles. Hand-held candles shall not be passed from one person to another while lighted.

308.1.9~~308.1.7.1~~ **Aisles and exits.** Candles shall be prohibited in areas where occupants stand, or in an *aisle* or *exit*.

308.1.10 ~~308.1.8~~ **Flaming food and beverage preparation.** The preparation of flaming foods or beverages in places of assembly and drinking or dining establishments shall be in accordance with Sections 308.1.8.1 through 308.1.8.5.

308.1.10.1~~308.1.8.1~~ **Dispensing.** *Flammable* or *combustible liquids* used in the preparation of flaming foods or beverages shall be dispensed from one of the following:

1. A 1-ounce (29.6 ml) container.

2. A container not exceeding 1-quart (946.5 ml) capacity with a controlled pouring device that will limit the flow to a 1-ounce (29.6 ml) serving.

308.1.10.2~~308.1.8.2~~ **Containers not in use.** Containers shall be secured to prevent spillage when not in use.

308.1.10.3~~308.1.8.3~~ **Serving of flaming food.** The serving of flaming foods or beverages shall be done in a safe manner and shall not create high flames. The pouring, ladling or spooning of liquids is restricted to a maximum height of 8 inches (203 mm) above the receiving receptacle.

308.1.10.4~~308.1.8.4~~ **Location**. Flaming foods or beverages shall be prepared only in the immediate vicinity of the table being serviced. They shall not be transported or carried while burning.

308.1.10.5~~308.1.8.5~~ **Fire protection.** The person preparing the flaming foods or beverages shall have a wet cloth towel immediately available for use in smothering the flames in the event of an emergency.

308.4.1 Group R-2 dormitories. Candles, incense and similar open-flame-producing items shall not be allowed in *dwelling units* or *sleeping units* in Group R-2 dormitory occupancies.

310.2 Prohibited areas. Smoking shall be prohibited where conditions are such as to make smoking a hazard, and in spaces where flammable or combustible materials are stored or handled.

> **Exception:** In Group I-2 occupancies, patients shall be permitted to smoke in designated patient care areas, based on clinical needs of the patient.

310.2.1 Group I-2. In Group I-2 occupancies smoking shall be prohibited in patient care areas, or where oxygen is used, stored or handled.

310.3 "No Smoking" signs. The *fire code official* is authorized to order the posting of "No Smoking" signs or the international symbol for no smoking in a conspicuous location in each structure or location in which smoking is prohibited. The content, lettering, size, color and location of required "No Smoking" signs shall be approved.

> **Exception:** ~~In Group I-2 occupancies where smoking is prohibited,~~ "No Smoking" signs are not required in interior locations of the facility where signs are displayed at all major entrances into the facility.

310.6 Ash trays. Where smoking is permitted, suitable noncombustible ash trays or match receivers shall be provided on each table and at other appropriate locations. In Group I-2 occupancies, non-combustible metal containers with self-closing covers shall be provided in areas where smoking is permitted.

311.2.2 Fire protection. Fire ~~alarm, sprinkler and stand-pipe~~ protection systems shall be maintained in an operable condition at all times.

Exceptions:

1. Where the premises have been cleared of all combustible materials and debris and, in the opinion of the *fire code official*, the type of construction, *fire separation distance* and security of the premises do not create a fire hazard.

2. Where approved by the *fire code official*, buildings that will not be heated and where *fire protection systems* will be exposed to freezing temperatures, fire alarm and *automatic* *sprinkler systems* are permitted to be placed out of service and standpipes are permitted to be maintained as dry systems (without an automatic water supply), provided that the building does not have contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons.

3. Where *approved* by the *fire code official*, fire alarm and *automatic* *sprinkler systems* are permitted to be placed out of service in seasonally occupied buildings: that will not be heated; where *fire protection systems* will be exposed to freezing temperatures; where *fire areas* do not exceed 12,000 square feet (1115 m^2); and that do not store motor vehicles or hazardous materials.

313.1 General. Fueled equipment including, but not limited to, motorcycles, mopeds, lawn-care equipment, and portable generators ~~and portable cooking equipment~~, shall not be stored, operated or repaired within a building.

Exceptions:

1. Buildings or rooms constructed for such use in accordance with the *International Building Code*.

2. Where allowed by Section 314.

3. Storage of equipment utilized for maintenance purposes is allowed in *approved* locations where the aggregate fuel capacity of the stored equipment does not exceed 10 gallons (38 L) and the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

4. Fuel-fired portable heating and cooking equipment stored, operated, or repaired in accordance with Chapter 41.

314.4 Vehicles. Liquid-fueled or gaseous-fueled vehicles, aircraft, boats or other motorcraft shall not be located indoors except as follows:

1. The engine starting system is made inoperable or ignition batteries are disconnected except where the *fire code official* requires that the batteries remain connected to maintain safety features.

2. Fuel in fuel tanks does not exceed any of the following:

   2.1. Class I, II and III liquid fuel does not exceed one-quarter tank or 5 gallons (19 L), whichever is less.

   2.2. LP gas does not exceed one-quarter tank or 6.6 gallons (25 L), whichever is less.

   2.3. CNG does not exceed one-quarter tank or 630 cubic feet (17.8 m3), whichever is less.

   2.4. Hydrogen does not exceed one-quarter tank or 2000 cubic feet (0.57 m3), whichever is less

3. Fuel tanks and fill openings are closed and sealed to prevent tampering.

4. Vehicles, aircraft, boats or other motorcraft equipment are not fueled or defueled within the building.

315.3.1 Ceiling clearance. Storage shall be maintained 2 feet (610 mm) or more below the ceiling in nonsprinklered areas of buildings or not less than 18 inches (457 mm) below sprinkler ~~head~~ deflectors in sprinklered areas of buildings.

Exceptions:

1. The 2-foot (610 mm) ceiling clearance is not required for storage along walls in nonsprinklered areas of buildings.

2. The 18-inch (457 mm) ceiling clearance is not required for storage along walls in areas of buildings equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

TABLE 315.7.6(1)
SEPARATION DISTANCE BETWEEN WOOD PALLET STACKS AND BULDINGS

WALL CONSTRUCTION	OPENING TYPE	WOOD PALLET SEPARATION DISTANCE (feet)		
		≤ 50 Pallets	51 to 200 Pallets	> 200 Pallets
Masonry	None	2	2	2
Masonry	Fire-rated glazing with open sprinklers	2	5	20
Masonry	Fire-rated glazing	~~10~~5	~~5~~10	20
Masonry	Plain glass with open sprinklers	~~10~~5	~~5~~10	20
Noncombustible	None	~~10~~5	~~5~~10	20
Wood with open sprinklers	—	~~10~~5	~~5~~10	20
Wood	None	15	30	90
Any	Plain glass	15	30	90

For SI: 1 foot = 304.8 mm.

SECTION 317~~ROOFTOP GARDENS AND~~ VEGETATIVE AND LANDSCAPED ROOFS

317.1 General. ~~Rooftop gardens and~~Vegetative and landscaped roofs shall comply with ~~be installed and maintained in accordance with Sections 317.2 through 317.5 and~~ Sections 1505 and 1507.15 of the *International Building Code* and be installed and maintained in accordance with Sections 317.2 through 317.5.

~~**317.2 Rooftop garden or landscaped roof size.** Rooftop garden or landscaped roof areas shall not exceed 15,625 square feet (1450 m$_2$) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a Class A rated roof system complying with ASTM E108 or UL 790 shall be provided between adjacent rooftop gardens or landscaped roof areas.~~

~~**317.3 Rooftop structure and equipment clearance.** For all vegetated roofing systems abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E108 or UL 790 shall be achieved for a minimum 6-footwide (1829 mm) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports and building service equipment.~~

~~**317.4**~~ **317.2 Vegetation.** Vegetation shall be maintained in accordance with Sections 317.2.1 and 317.2.2. ~~317.4.1 and 317.4.2.~~

~~**317.4.1**~~ **317.2.1 Irrigation.** Supplemental irrigation shall be provided to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

~~**317.4.2**~~ **317.2.2 Dead foliage.** Excess biomass, such as overgrown vegetation, leaves and other dead and decaying material, shall be removed at regular intervals not less than two times per year.

~~317.4.3~~ **317.3 Maintenance plan.** The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a *vegetative roof* ~~garden~~ or *landscaped roof* area, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.

~~**317.5**~~ **317.4 Maintenance equipment**. Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

SECTION 320
ADDITIVE MANUFACTURING (3D PRINTING)

320.1 General. *Additive manufacturing* equipment and operations shall comply with Section 320.

320.1.1 Scope. *Additive manufacturing* shall comply with one of the following:

1.Nonindustrial *additive manufacturing* shall comply with Section 320.2.

2. Industrial *additive manufacturing* shall comply with Section 320.3.

320.1.2 Installation, operation and maintenance. 3D printers and associated additive manufacturing equipment shall be installed, operated and maintained in accordance with this Code, the listing and the manufacturer's instructions.

320.1.3 Production materials. Only the production materials listed for use with the equipment and included in the manufacturer's instructions shall be used.

320.2 Nonindustrial additive manufacturing. Nonindustrial additive manufacturing equipment and operations shall comply with Sections 320.2.1 and 320.2.2. Additive manufacturing equipment and operations that do not comply with Section 320.2 shall comply with Section 320.3.

320.2.1 Listing. 3D printers used in nonindustrial additive manufacturing shall be listed and labeled in accordance with UL 2011, UL 60950-1 or UL 62368-1. The listing shall also verify:

1. The 3D printers are self-contained and utilize maximum 30-liter prepackaged production materials.

2. The operation of the 3D printers shall not create a hazardous (classified) electrical area or zone outside the unit.

3. If any hazardous (classified) electrical area or zone exists inside the unit's outer enclosure, the area shall be protected by intrinsically safe electrical construction or other acceptable protection methods.

4. The 3D printers shall not utilize inert gas or an external combustible dust collection system.

320.2.2 Occupancies. Nonindustrial additive manufacturing shall be permitted in all occupancy groups.

320.3 Industrial additive manufacturing. Industrial additive manufacturing equipment and operations shall comply with Sections 320.3.1 through 320.3.12.

320.3.1 Permits required. Permits shall be obtained from the fire code official in accordance with Section 105.5 prior to engaging in industrial additive manufacturing operations.

320.3.2 Listing. 3D printers used in industrial additive manufacturing shall be listed and labeled in accordance with UL 2011 or approved for the application based on a field evaluation conducted by an approved agency.

320.3.3 Combustible dusts and metals. Industrial additive manufacturing operations that store, use or produce combustible dust, combustible particulate solids or combustible metals shall comply with Chapter 22 and this section.

320.3.4 Powder evaluation. Printing powders used in industrial additive manufacturing operations shall be tested for combustibility in accordance with NFPA 484 or NFPA 652 as applicable. A copy of test reports shall be provided to the fire code official upon request.

320.3.5 Combustible (nonmetallic) dusts. Industrial additive manufacturing operations that store, use or produce combustible (nonmetallic) dusts shall comply with NFPA 654.

320.3.6 Combustible metals. Industrial additive manufacturing operations that store or use combustible metals shall comply with NFPA 484.

320.3.7 Ancillary equipment. Ancillary equipment provided for recycling, sieving, vacuuming or handling combustible powders shall be designed and approved for such use.

320.3.8 Hazardous materials. Industrial additive manufacturing operations that store or use hazardous materials exceeding the maximum allowable quantity limits shall comply with Chapter 50.

320.3.9 Inert gas. Additive manufacturing processes that utilize inert gases shall comply with Chapter 53. Ventilation or gas detection shall be provided in accordance with Section 5307.

320.3.10 Technical assistance. Where required by the fire code official, a report evaluating the acceptability of technologies, processes, products, facilities, materials and uses associated with the operation shall be provided in accordance with Section 104.8.2 and approved.

320.3.11 Performance-based design alternative. Where approved by the fire code official, buildings and facilities where industrial additive manufacturing is performed shall be permitted to comply with the performance-based design options in Section 5001.3 as an alternative to compliance with the other requirements set forth in this section.

320.3.12 Occupancies. Industrial additive manufacturing shall be conducted only in the occupancy groups associated with manufacturing operation and permitted by the Chapter 50 maximum allowable quantity tables. Where approved, the requirements in Section 320.3.6 shall be permitted to provide the technical basis for determining compliance with Table 5003.1.1(1), Note q.

SECTION 321 LITHIUM-ION AND LITHIUM METAL BATTERY STORAGE

321.1 General. The storage of lithium-ion and lithium metal batteries shall comply with Section 321.

Exceptions:

1. New or refurbished batteries installed in the equipment, devices, or vehicles they are designed to power.

2. New or refurbished batteries packed for use with the equipment, devices, or vehicles they are designed to power.

3. Batteries in original retail packaging that are rated at 300 watt-hours or less for lithium-ion batteries or contain 25 grams or less of lithium metal for lithium metal batteries.

4. Temporary storage of batteries or battery components during the battery manufacturing process prior to completion of final quality control checks.

5. Temporary storage of batteries during the vehicle manufacturing or repair process.

321.2 Permits. Permits shall be required for an accumulation of more than 15 cubic feet (0.42 m) of lithium-ion and lithium metal batteries, other than batteries listed in the exceptions to Section 321.1, as set forth in Section 105.6.29.

321.3 Fire safety plan. A fire safety plan shall be provided in accordance with Section 404. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

321.4 Storage requirements. Lithium-ion and lithium metal batteries shall be stored in accordance with Section 321.4.1, 321.4.2, or 321.4.3, as applicable.

321.4.1 Limited indoor storage in containers. Not more than 15 cubic feet (0.42 m^3) of lithium-ion or lithium metal batteries shall be permitted to be stored in containers in accordance with all of the following.

1. Containers shall be open-top and constructed of noncombustible materials or shall be approved for battery collection.

2. Individual containers and groups of containers shall not exceed a capacity of 7.5 cubic feet (0.21 m^3).

3. A second container or group of containers shall be separated by not less than 3 feet (914 mm) of open space, or 10 feet (3048 mm) of space that contains combustible materials.

4. Containers shall be located not less than 5 feet (1524 mm) from exits or exit access doors.

321.4.2 Indoor storage areas. Indoor storage areas for lithium-ion and lithium metal batteries, other than those complying with Section 321.4.1, shall comply with Sections 321.4.2.1 through 321.4.2.6.

321.4.2.1 Technical opinion and report. A technical opinion and report complying with Section 104.2.2 shall be prepared to evaluate the fire and explosion risks associated with the indoor storage area and to make recommendations for fire and explosion protection. The report shall be submitted to the fire code official and shall require the fire code official's approval prior to issuance of a permit. In addition to the requirements of Section 104.2.2, the technical opinion and report shall specifically evaluate the following:

1. The potential for deflagration of flammable gases released during a thermal runaway event.

2. The basis of design for an automatic sprinkler system or other approved fire suppression system. Such design basis shall reference relevant full-scale fire testing or another approved method of demonstrating sufficiency of the recommended design.

321.4.2.2 Construction requirements. Where indoor storage areas for lithium-ion and lithium metal batteries are located in a building with other uses, battery storage areas shall be separated from the remainder of the building by 2-hour rated fire barriers or horizontal assemblies. Fire barriers shall be constructed in accordance with Section 707 of the International Building Code, and horizontal assemblies shall be constructed in accordance with Section 711 of the International Building Code.

Exceptions:

1. Where battery storage is contained in one or more approved prefabricated portable structures providing a complete 2-hour fire resistance rated enclosure, fire barriers and horizontal assemblies are not required.

2. Where battery storage is limited to new batteries in packaging that has been demonstrated to and approved by the fire code official as sufficient to isolate a fire in packaging to the package interior, fire barriers and horizontal assemblies are not required.

321.4.2.3 Fire protection systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be protected by an automatic sprinkler system complying with Section 903.3.1.1 or an approved alternative fire suppression system. The system design shall be based on recommendations in the approved technical opinion and report required by Section 321.4.2.1.

321.4.2.4 Fire alarm systems. Indoor storage areas for lithium-ion and lithium metal batteries shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use air-aspirating smoke detection, radiant energy-sensing fire detection, or both.

321.4.2.5 Explosion control. Where the approved technical opinion and report required by Section 321.4.2.1 recommends explosion control, explosion control complying with Section 911 shall be provided.

321.4.2.6 Reduced requirements for storage of partially charged batteries. Indoor storage areas for lithium-ion and lithium metal batteries with a demonstrated state of charge not exceeding 30 percent shall not be required to comply with Sections 321.4.2.1, 321.4.2.2, and 321.4.2.5, provided that procedures for limiting and verifying that the state of charge will not exceed 30 percent have been approved.

321.4.3 Outdoor Storage. Outdoor storage of lithium-ion or lithium metal batteries shall comply with Sections 321.4.3.1 through 321.4.3.3.

321.4.3.1 Distance from storage to exposures. Outdoor storage of lithium-ion or lithium metal batteries, including storage beneath weather protection in accordance with Section 414.6.1 of the International Building Code, shall comply with one of the following.

1. Battery storage shall be located not less than 20 feet (6096 mm) from any building, lot line, public street, public alley, public way or means of egress.

2. Battery storage shall be located not less than 3 feet (914mm) from any building, lot line, public street, public alley, public way or means of egress, where the battery storage is separated by a 2-hour fire-resistance rated assembly without openings or penetrations and extending 5 feet (1524 mm) above and to the sides of the battery storage area.

3. Battery storage shall be located not less than 3 feet (914 mm) from any building, lot line, public street, public alley, public way or means of egress, where batteries are contained in approved prefabricated portable structures providing a complete 2-hour fire-resistance rated enclosure.

321.4.3.2 Storage area size limits and separation. Outdoor storage areas for lithium-ion or lithium metal batteries, including storage beneath weather-protection in accordance with Section 414.6.1 of the International Building Code, shall not exceed 900 sq. ft (83.6 m^2). The height of battery storage in such areas shall not exceed 10 feet (3048 mm). Multiple battery storage areas shall be separated from each other by not less than 10 feet (3048 mm) of open space.

321.4.3.3 Fire detection. Outdoor storage areas for lithium-ion or lithium metal batteries, regardless of whether such areas are open, under weather protection or in a prefabricated portable structure, shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use radiant energy-sensing fire detection.

SECTION 322 ARTIFICIAL COMBUSTIBLE VEGETATION

322.1 Artificial combustible vegetation on roofs and near buildings. Artificial combustible vegetation exceeding 6 feet (1829 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building or on the roof of a building shall comply with Section 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

SECTION 322 POWERED MICROMOBILITY DEVICES.

322.1 General. Lithium-ion and lithium metal battery *powered micromobility devices* shall be operated and maintained in accordance with this section.

Exceptions:

1. Storage, repair and charging in residential occupancies of *powered mobility devices*, provided that such devices are for personal use by its owner.

2. Charging of a single *powered mobility device* in any occupancy by its owner.

322.1.1 Prohibited locations. The use of a residential occupancy as a business for the charging of commercially owned powered mobility devices as part of a rental or sales service shall not be permitted.

322.2 Battery chargers and equipment. *Powered micromobility devices* shall be charged in accordance with their listing and the manufacturer's instructions using only the original equipment manufacturer-supplied charging equipment or charging equipment in accordance with the listing and manufacturer's instructions.

322.3 Listing. *Powered micromobility devices* shall be listed and labeled in accordance with UL 2272 or UL 2849, as applicable.

322.4 Battery charging areas. Where approved, *powered micromobility devices* shall permitted to be charged in a room or area that complies with all of the following:

1. Only listed devices utilizing listed charging equipment shall be permitted to be charged.

2. Is provided with sufficient electrical receptacles to allow the charging equipment for each device to be directly connected to a receptacle. Extension cords and relocatable power taps shall not be used.

3. Storage of combustible materials, combustible waste or hazardous materials shall not be permitted.

4. The charging operation shall not be conducted in or obstruct any required means of egress.

5. Removable storage batteries shall not be stacked or charged in an enclosed cabinet unless the cabinet is specially designed and approved for such purpose.

6. A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations unless each battery is isolated from neighboring batteries by an approved fire-resistant material.

7. A minimum of 18 inches (457.2 mm) shall be maintained between the locations of the batteries on each *powered micromobility devices* during charging operations.

8. The indoor room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection.

322.5 Fire safety plan. A fire safety plan shall be provided in accordance with Section 403.10.6. In addition, the fire safety plan shall include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage.

SECTION 323~~2~~ LIVE FIRE TRAINING FACILITY.

[NY]320~~0~~3.1 Live fire training facilities.

Live fire training facilities shall be designed, constructed, and maintained in accordance with NFPA 1402 and NFPA 1403.

CHAPTER 4 EMERGENCY PLANNING AND PREPAREDNESS

[NY] 401.4.1 Evacuation. Unless otherwise specified in an approved fire safety and evacuation plan, all occupants shall evacuate the building.

403.1 General. In addition to the requirements of Section 401, occupancies, uses and outdoor locations shall comply with the emergency preparedness requirements set forth in Sections 403.2 through 403.11.3.3. Where a fire safety and evacuation plan is required by Sections 403.2 through ~~403.10.5~~ 403.10.6, evacuation drills shall be in accordance with Section 405 and employee training shall be in accordance with Section 406.

~~403.4~~ **403.3 Group B occupancies.** An approved fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for buildings containing a Group B occupancy where the Group B occupancy has an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge and for buildings having an ambulatory care facility.

~~403.3.1~~**403.3.1.1 Fire safety and evacuation plan.** The fire safety and evacuation plan required by Section 404 shall include a description of special staff actions. This shall include procedures for stabilizing ~~patients~~ care recipients in a *defend-in-place* response, staged evacuation, or full evacuation in conjunction with the entire building if part of a multitenant facility.

~~403.3.2~~**403.3.1.1.1 Fire safety plan.** A copy of the fire safety plan shall be maintained at the facility at all times. The plan shall include all of the following in addition to the requirements of Section 404:

1. Locations of ~~patients~~ care recipients who are rendered incapable of self-preservation.
2. Maximum number of ~~patients~~ care recipients rendered incapable of self-preservation.
3. Area and extent of each ambulatory care facility.
4. ~~Location of adjacent smoke compartments or refuge areas, where required.~~
5. ~~Path of travel to adjacent smoke compartments.~~
6. Location of any special locking, ~~delayed egress or access control~~ arrangements.

~~403.3.3~~ **403.3.1.2 Staff training.** ~~Employees~~Staff shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Records of instruction shall be maintained. Such instruction shall be reviewed by the staff ~~not less than every two months. A copy of the plan shall be readily available at all times within the facility.~~at intervals not exceeding three months. Training of new staff shall be provided promptly upon entrance to duty.

Staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.

~~**403.3.4 Emergency evacuation drills.** Emergency evacuation drills shall comply with Section 405.~~

~~**Exception:** The movement of patients to safe areas or to the exterior of the building is not required.~~

[NY] 403.4 Group E occupancies.

An *approved* fire safety and evacuation plan in accordance with Section 404, and where required, a School Safety Plan and building level emergency response plan in accordance with Education Law §2801-a, shall be prepared and maintained for Group E occupancies and for buildings containing both a Group E occupancy and an atrium. Group E occupancies shall comply with Sections 403.4.1 through 403.4.4.

[NY] 403.4.4 Education Law drill requirements for Group E occupancies.

In addition to other requirements, the frequency and timing of drills shall be in accordance with the requirements of Education Law §807(1), which requires not less than 12 drills in each school year, eight of which shall take place between September 1 and December 31. Eight of all such drills shall be evacuation drills, four of which shall be through use of fire escapes on buildings where fire escapes are provided or through the use of identified secondary means of egress. Four of all such required drills shall be lock-down drills.

Drills shall be conducted at different times of the school day. Pupils shall be instructed in the procedure to be followed in the event that a fire occurs during the lunch period or assembly, provided however, that such additional instruction may be waived where a drill is held during the regular school lunch period or assembly. At least four additional drills shall be held in each school year during the hours after sunset and before sunrise in school buildings in which students are provided with sleeping accommodations.

At least two additional drills shall be held during summer school, in buildings where summer school is conducted, and one of such drills shall be held during the first week of summer school.

403.7 ~~403.8~~ **Group I occupancies.** An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group I occupancies. Group I occupancies shall comply with Sections 403.7~~8~~.1 through 403.7~~8~~.3.~~4~~6.

403.7.1 ~~403.8.1~~ **Group I-1 occupancies.** Group I-1 occupancies shall comply with Sections 403.7~~8~~.1.1 through 403.7~~8~~.1.7.

~~403.8.1.1~~ 403.7.1.1 **Fire safety and evacuation plan.** The fire safety and evacuation plan required by Section 404 shall include ~~special employee actions, including fire protection procedures necessary for residents, and shall~~ a description of special staff actions. Plans shall include all of the following in addition to the requirements of Section 404:

1. Procedures for full evacuation of care recipients.
2. In Group I-1, Condition 2, procedures for staged evacuation of care recipients through a refuge area in an adjacent *smoke compartment* and then to an exterior assembly point.
3. Shall be amended or revised upon admission of any ~~resident~~ care recipient with unusual needs.

~~**403.8.1.1.1 Fire evacuation plan.** The fire evacuation plan required by Section 404 shall include a description of special staff actions. In addition to the requirements of Section 404, plans in Group I-1, Condition 2 occupancies shall include procedures for evacuation through a refuge area in an adjacent smoke compartment and then to an exterior assembly point.~~

~~403.8.1.1.2~~ 403.7.1.1.1 **Fire safety ~~plans~~ plan.** A copy of the fire safety plan shall be maintained at the facility at all times. ~~Plans~~ The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of ~~resident~~ care recipient sleeping rooms.
2. Location of special locking ~~or egress control~~ arrangements.

~~403.8.1.2~~ 403.7.1.2 ~~**Employee**~~ **Staff training.** ~~Employees~~ Staff shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Records of instruction shall be maintained. Such instruction shall be reviewed by ~~employees~~ staff at intervals not exceeding ~~two~~ three months. ~~A copy of the plan shall be readily available at all times within the facility.~~ Training of new staff shall be provided promptly upon entrance to duty.

Staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.

~~403.8.1.3~~403.7.1.3 **Resident training.** Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. In Group I-1, Condition 2 occupancies, training shall include evacuation through an adjacent *smoke compartment* and then to an exterior assembly point. The training shall include actions to take if the primary escape route is blocked. ~~Where the resident is given rehabilitation or habilitation training, methods of fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program.~~ Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

403.7.1.4 ~~403.8.1.4~~ **Drill frequency.** In addition to the evacuation drills required in Section 405.2,~~employees~~ staff shall participate in drills an additional two times a year on each shift. Twelve drills with all occupants shall be conducted in the first year of operation. ~~Drills are not required to comply with the time requirements of Section 405.4.~~

~~**403.8.1.5 Drill times.** Drill times are not required to comply with Section 405.4.~~

~~**403.8.1.6 Resident participation in drills.** Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.~~

~~**403.8.1.7 Emergency evacuation drill deferral.** In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency specified in Section 405.2.~~

~~**403.8.2**~~**403.7.2 Group I-2 occupancies.** Group I-2 occupancies shall comply with ~~Sections 401~~, 403.7.2.1 through 403.7~~8~~.2.5~~3~~. ~~and 404 through 406~~.

~~**403.8.2.1**~~**403.7.2.1 Fire safety and evacuation plan ~~plans~~**. The fire safety and evacuation plans required by Section 404 shall include a description of special staff actions. Plans shall include all of the following in addition to the requirements of Section 404:

1. Procedures for evacuation for ~~patients~~ care recipients with needs for containment or restraint and post-evacuation containment, where present.
2. A written plan for maintenance of the means of egress.
3. Procedure for a defend-in-place strategy.
4. Procedures for a full-floor or building evacuation, where necessary.
5. In Group I-2, Condition 2, amendments or revisions upon admission of any care recipients with unusual needs.

~~**403.8.2.2**~~**403.7.2.2 Fire safety plan ~~plans~~.** A copy of the fire safety plan shall be maintained at the facility at all times. The plan ~~Plans~~ shall include all of the following in addition to the requirements of Section 404.2.2:

1. Location and number of ~~patient~~ care recipient sleeping rooms and operating rooms.

~~2. Location of adjacent smoke compartments or refuge areas.~~

~~3. Path of travel to adjacent smoke compartments.~~

~~4~~.2**.** Location of special locking~~, delayed egress or access control~~ arrangements.

~~5. Location of elevators utilized for patient movement in accordance with the fire safety plan, where provided.~~

~~**403.8.2.3**~~**403.7.2.3 Staff training.** Staff shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Records of instruction shall be maintained. Such instruction shall be reviewed by staff at intervals not exceeding three months. Training of new staff shall be provided promptly upon entrance to duty.

Staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.

~~**403. 8.2.3**~~ **403.7.2.4 Emergency evacuation drills.** Emergency evacuation drills shall comply with Section 405.

~~**Exceptions:**~~

~~1. The movement of patients to safe areas or to the exterior of the building is not required.~~

~~2.Where emergency evacuation drills are conducted after visiting hours or where patients or residents are expected to be asleep, a coded announcement shall be an acceptable alternative to audible alarms.~~

403.7.2.5 Fire loss prevention in operating rooms. Fire protection features and procedures for fire loss prevention in surgical operating rooms shall comply with NFPA 99, Section 16.13.

~~**403.8.3**~~**403.7.3 Group I-3 occupancies.** Group I-3 occupancies shall comply with Sections 403.7~~8~~.3.1 through 403.7~~8~~.3.~~4~~6.

[NY] 403.7.3.1 Fire safety and evacuation plans. The fire safety and evacuation plans required by Section 404 shall include a description of special staff actions. Plans shall include all of the following in addition to the requirements of Section 404:

1. Procedures for evacuation of detained individuals with needs for containment or restraint and post-evacuation containment, where present.

2. Procedures for a *defend-in-place* strategy.

3. Procedures for a full-floor or building evacuation, where necessary.

[NY]403.7.3.2 Fire safety plan. A copy of the fire safety plan shall be maintained at the facility at all times. The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of cells.

2. Location of special locking arrangements.

3. Where locked doors are permitted in the *means of egress*, the location keys that operate such doors shall be identified in the fire safety and evacuation plan.

[NY] ~~**403.8.3.1**~~ **403.7.3.3** ~~**Employee**~~ **Staff training.** ~~Employees~~Staff shall be ~~instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment. Training of new employees~~ periodically instructed and kept informed of their duties and responsibilities under the plan. Records of instruction shall be maintained. Such instruction shall be reviewed by staff at intervals not exceeding three months. Training of new staff shall be provided promptly upon entrance to duty. ~~Refresher training shall be provided not less than annually.~~

1. Staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.
2. Where locked doors are permitted in the *means of egress*, staff shall be trained on the identification and use of keys that are necessary for unlocking doors.

~~**403.8.3.2**~~ **403.7.3.4** ~~**Employee staffing.**~~ **Staffing.** Group I-3 occupancies shall be provided with 24-hour staffing. ~~An employee~~ A staff person shall be within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area. In Group I-3 Conditions 3, 4 and 5, as defined in Chapter 2, the arrangement shall be such that the ~~employee~~ staff involved can start release of locks necessary for emergency evacuation or rescue and initiate other necessary emergency actions within 2 minutes of an alarm.

Exception: ~~An employee~~ A staff person shall not be required to be within three floors or 300 feet (91 440 mm) horizontal distance of the access door of each resident housing area in areas in which all locks are unlocked remotely and automatically in accordance with Section 408.4 of the *International Building Code*.

403.~~8~~7.3.~~3~~5 Notification. Provisions shall be made for residents in Group I-3 Conditions 3, 4 and 5, as defined in Chapter 2, to readily notify ~~an employee~~ staff of an emergency.

[NY] 403.~~8~~7.3.~~4~~6 Keys. Staff shall be trained on the identification and use of keys that are necessary for unlocking doors that are installed in the means of egress in Institutional Group I-3 occupancies. Keys that operate doors installed in the means of egress shall be identified in the fire safety and evacuation plan. Training shall be consistent with Section 406 of the *Fire Code of New York State*~~.~~

403 .9 ~~**403.10**~~ **Group R occupancies.** Group R occupancies shall comply with Sections 403.9.1 through 403.9.3.6.

403.~~9~~10.1.1 Evacuation diagrams. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each hotel or motel *dwelling unit* or *sleeping unit.*

[NY] 403.~~10~~9.2Group R-2 occupancies. Group R-2 occupancies shall comply with Sections 403.~~10~~9.2.1 through 403.~~10~~9.2.4.

403.~~10~~9.2.3 Evacuation diagrams for dormitories. A diagram depicting two evacuation routes shall be posted on or immediately adjacent to every required egress door from each dormitory sleeping unit or dwelling unit. Evacuation diagrams shall be reviewed and updated as needed to maintain accuracy.

[NY]403.~~10~~9.2.4 Education Law requirements for Group R-2 college and university buildings. In addition to other requirements, the frequency and timing of drills shall be in accordance with the requirements of Section 807.3 of the Education Law, which requires not less than three drills annually, one of which shall take place between September 1 and December 31. At least one of the drills shall use fire escapes, where fire escapes are provided. Where summer sessions are provided, at least one of the required drills shall be held during the first week of summer session. At least one additional drill shall be held in each year during the hours after sunset and before sunrise in college or university buildings in which students are provided with sleeping accommodations.

403 .9.3 ~~403.10.3~~ **Group R-4 occupancies.** An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-4 occupancies. Group R-4 occupancies shall comply with Sections 403.9.3.1 through 403.9.3.4

~~403.10.3.1~~403.9.3.1 **Fire safety and evacuation plan.** The fire safety and evacuation plan required by Section 404 shall include ~~special employee actions, including fire protection~~ a description of special staff actions. Plans shall include procedures necessary for ~~residents~~ full evacuation of care recipients, and shall be amended or revised upon admission of a ~~resident~~ care recipients with unusual needs.

~~403.10.3.1.1~~ 403.9.3.1.1 **Fire safety plans.** A copy of the fire safety plan shall be maintained at the facility at all times. ~~Plans~~ The plan shall include the following in addition to the requirements of Section 404.2.2:

1.Location and number of ~~resident~~ care recipient sleeping rooms.

2.Location of special locking ~~or egress control~~ arrangements.

~~403.10.3.2~~ 403.9.3.2 ~~**Employee**~~ **Staff training.** ~~Employees~~ Staff shall be periodically instructed and kept informed of their duties and responsibilities under the plan. Records of instruction shall be maintained. Such instruction shall be reviewed by ~~employees~~ staff at intervals not exceeding ~~two~~ three months. ~~A copy of the plan shall be readily available at all times within the facility.~~ Training of new staff shall be provided promptly upon entrance to duty.

Staff shall be instructed in the proper use of portable fire extinguishers and other manual fire suppression equipment.

~~403.10.3.3~~ 403.9.3.3 **Resident training.** Residents capable of assisting in their own evacuation shall be trained in the proper actions to take in the event of a fire. The training shall include actions to take if the primary escape route is blocked. ~~Where the resident is given rehabilitation or habilitation training, methods of fire prevention and actions to take in the event of a fire shall be a part of the rehabilitation training program.~~ Residents shall be trained to assist each other in case of fire to the extent their physical and mental abilities permit them to do so without additional personal risk.

~~403.10.3.4~~ 403.9.3.4 **Drill frequency.** In addition to the evacuation drills required in Section 405.3, ~~employees~~ staff shall participate in drills an additional two times a year on each shift. Twelve drills with all occupants shall be conducted in the first year of operation.

~~**403.10.3.5 Drill times.** Drill times are not required to comply with Section 405.4.~~

~~**403.10.3.6 Resident participation in drills.** Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.~~

~~**Exception:** Actual exiting from emergency escape and rescue windows shall not be required. Opening the emergency escape and rescue window and signaling for help shall be an acceptable alternative.~~

403.10 Special uses. Special uses shall be in accordance with Sections 403.10.1 through ~~403.10.5~~ 403.10.6.1.

~~403.11.1~~ 403.10.1 **Covered and open mall buildings. (no change to text)**

~~403.11.1.1~~ 403.10.1.1 **Malls and mall buildings exceeding 50,000 square feet. (no change to text)**

~~403.11.1.2~~ 403.10.1.2 **Lease plan.** In addition to the requirements of Section 404.2.2, a lease plan that includes the following information shall be prepared for each covered and open mall building:

1. Each occupancy, including identification of tenant.
2. *Exits* from each tenant space.
3. Fire protection features, including the following:
    3.1. Fire department connections.
    3.2. *Fire command center*.
    3.3. Smoke management system controls.
    3.4. Elevators, elevator machine rooms and controls.
    3.5. Hose valve outlets.

3.6. Sprinkler and standpipe control valves.

3.7. ~~Automatic~~ Areas protected with *automatic sprinkler systems* and *automatic* *fire-extinguishing* ~~system areas.~~ *systems.*

3.8. Automatic fire detector zones.

3.9. Fire ~~barriers.~~walls, fire barriers, fire partitions

403.10.6 Lithium-ion and lithium metal batteries. An *approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling or storage of lithium-ion batteries or lithium metal batteries, or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries.

Exceptions: A fire safety and evacuation plan is not required for the storage or merchandizing of any of the following:

1. New or refurbished batteries installed for use in the equipment or vehicles they are designed to power.
2. New or refurbished batteries packed for use with the equipment or vehicles they are designed to power for merchandizing purposes.
3. New or refurbished lithium-ion batteries rated at not more than 300 watt-hours and lithium metal batteries containing not more than 25 grams of lithium metal in their original retail packaging.
4. The storage, repair and charging activities in detached one- and two-family *dwellings* and *townhouses*, provided that such devices are for personal use.
5. The storage, repair and charging activities associated with personal use in *sleeping units* and *dwelling units* of Group R-1 and R-2 occupancies.

403.10.6.1 Mitigation planning. The approved fire safety and evacuation plan shall include thermal runaway event mitigation measures. These measures shall include activities undertaken to prevent thermal runaway, early detection of a thermal runaway event and mitigation measures to be undertaken to limit the size and impact of the event on occupants and the facility.

[NY] 404.1 General. Where required by Section 403 or other sections of this code, fire safety, evacuation and lockdown plans shall comply with Sections 404.2 through 404.4.1.

[NY] 404.2 Contents. Fire safety, evacuation and lockdown plan contents shall be in accordance with Sections 404.2.1 through 404.2.3.2.

[NY] 404.2.1 Fire evacuation plans. Fire evacuation plans shall include the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete by selected floors or areas only or where applicable, with a *defend-in-place* response.
2. Procedures for employees who must remain to operate critical equipment before evacuating.
3. Procedures for the use of elevators to evacuate the building where occupant evacuation elevators complying with Section 3008 of the *International Building Code* are provided.
4. Procedures for assisted rescue for persons unable to use the general *means of egress* unassisted.
5. Procedures for accounting for employees and occupants after evacuation has been completed.
6. Identification and assignment of personnel responsible for rescue or emergency medical aid.
7. The preferred and any alternative means of notifying occupants of a fire or emergency.
8. The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
9. Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan.
10. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided.

404.2.3 Lockdown plans. Lockdown plans shall only be permitted where such plans are approved by the fire code official and are in compliance with Sections 404.2.3.1 and 404.2.3.2.

[NY] 404.2.3.1 Lockdown plan contents.
Lockdown plans shall include the following:

1. Identification of individuals authorized to issue a lockdown order.
2. Security measures used during normal operations, when the building is occupied, that could adversely affect egress or fire department operations.
3. A description of identified emergency and security threats addressed by the plan, including specific lockdown procedures to be implemented for each threat condition.
4. Means and methods of initiating a lockdown plan for each threat, including:
   4.1. The means of notifying occupants of a lockdown event, which shall be distinct from the fire alarm signal.
   4.2. Identification of each door or other access point that will be secured.
   4.3. A description of the means or methods used to secure doors and other access points.
   4.4. A description of how locking means and methods are in compliance with the requirements of this code for egress and accessibility.
5. Procedures for reporting to the fire department any lockdown condition affecting egress or fire department operations.
6. Procedures for determining and reporting the presence or absence of occupants to emergency response agencies during a lockdown.
7. Except in Group E occupancy as determined by law enforcement, a m~~M~~eans for providing two-way communication between a central location and each area subject to being secured during a lockdown.
8. Identification of the prearranged signal for terminating the lockdown.
9. Identification of individuals authorized to issue a lockdown termination order.
10. Procedures for unlocking doors and verifying that the *means of egress* has been returned to normal operations upon termination of the lockdown.
11. Training procedures and frequency of lockdown plan drills.

404.3 Maintenance. Fire safety, ~~and~~ evacuation ~~plans~~ and lockdown plans shall be reviewed or updated annually or as necessitated by changes in staff assignments, occupancy or the physical arrangement of the building.

[NY] 404.4 Availability. Fire safety, ~~and~~ evacuation ~~plans~~ and lockdown plans shall be available in the ~~workplace~~ building for reference and review by employees and tenants, and copies shall be furnished to the fire code official and law enforcement personnel for review on request.

[NY] 404.4.1 Distribution. The fire safety, ~~**and**~~ evacuation ~~plans~~ and lockdown plans shall be distributed to the tenants and building service employees by the owner or owner's agent. Tenants with employees shall distribute to their employees applicable parts of the fire safety plan and lockdown plans affecting the employees' actions in the event of a fire or other emergency.

[NY] 404.4.2 Published formats. The fire safety and evacuation plans shall be made available in all of the following formats: large-print document (18-point font size or larger); Braille (Grade II); any other universally accessible formats in plain language upon request, such as:

1. PDF files and websites compliant with Level AA conformance of the latest published version of the Web Content Accessibility Guidelines (WCAG) standard.
2. Multilingual documents compliant with the top 12 most common non-English languages among Limited English Proficient (LEP) New Yorkers (Spanish, Chinese, Russian, Yiddish, Bangla, Korean, Haitian Creole, Italian, Arabic, Polish, French, Urdu).

SECTION 405
EMERGENCY ~~EVACUATION~~ DRILLS

405.1 General. Emergency fire and evacuation drills complying with Sections 405.2 through 405.9 shall be conducted not less than annually where fire safety and evacuation plans are required by Section 403 or where required by the fire code official. Lockdown plan drills shall be conducted in accordance with the *approved* plan. Such drills shall not be

substituted for fire and evacuation drills required by Section 405.2. Drills shall be designed in cooperation with the local authorities.

[NY] 405.2 Occupant participation. Emergency fire and evacuation drills shall involve the actual evacuation of occupants to a selected assembly point and shall provide occupants with experience in exiting through required *exits*.

Exceptions:

1.In Ambulatory Care Facilities and Group I-2 the movement of care recipients to a safe area or to the exterior of the building is not required.

2.In Group I-1, Condition 2 the assembly point for residents is permitted to be within an adjacent smoke compartment.

3.In Group R-4, actual exiting from emergency escape and rescue openings shall not be required. Opening the emergency escape and rescue opening and signaling for help shall be an acceptable alternative.

4.In Group I-3, Conditions 2 through 5 where a defend-in-place response is permitted, the assembly point for detained individuals is permitted to be within an adjacent *smoke compartment*.

5.In Group I-3, Conditions 2 through 5, movement of detainees to an assembly point is not required where there are security concerns.

405.32 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 405.3 or more frequently where necessary to familiarize all occupants with the drill procedure.

[NY] TABLE 405.32

FIRE AND EVACUATION DRILL FREQUENCY AND PARTICIPATION

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	~~Employees~~ Staff
Group A (College and University Buildings)	Three annually	All occupants
Group B~~b~~[a]	Annually	All occupants
Group B (College and University Buildings)	Three annually	All occupants
Group B~~c~~(Ambulatory care facilities)	Quarterly on each shift[a]	~~Employees~~ Staff
Group B~~b~~[a] (Clinic, outpatient)	Annually	~~Employees~~ Staff
Group E	See 403.5.4~~Monthly~~	All occupants
Group F	Annually	~~Employees~~ Staff
Group I-1	Semiannually on each shift[a]	All occupants
Group I-2	Quarterly on each shift[a]	~~Employees~~ Staff
Group I-3	Quarterly on each shift[a]	~~Employees~~ Staff

Group I-4	Monthly on each shift[a]	All occupants
Group R-1	Quarterly on each shift	~~Employees~~ Staff
Group R-2[d][b]	Four annually	All occupants
Group R-4	Semiannually on each shift[a]	All occupants

~~a.In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency.~~

~~b~~ a.Emergency evacuation drills are required in Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.

~~c.Emergency evacuation drills are required in ambulatory care facilities in accordance with Section 403.3.~~

~~d~~b.Emergency evacuation drills in Group R-2 college and university buildings shall be in accordance with Section 403.9~~10~~.2.1. Other Group R-2 occupancies shall be in accordance with Section 403.9~~10~~.2.2.

405.4~~5~~5 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of fire.

Exceptions:

1.In severe climates, the *fire code official* shall have the authority to modify the emergency evacuation drill termination points and frequency.

2.In Groups I-1, I-2, I-3 and R-4, where staff only emergency evacuation drills are conducted after visiting hours or where care recipients are expected to be asleep, a coded announcement shall be an acceptable alternative to audible alarms.

405.9~~8~~ Accountability. As building occupants arrive at the assembly point, efforts shall be made to determine if all occupants have been successfully evacuated or have been accounted for.

Exception: In Group I-2 and ambulatory care facilities, the movement of care recipients to safe areas or to the exterior of the building is not required.

[NY] 406.3 Employee training program. Employees shall be trained in fire prevention, evacuation and fire safety in accordance with Sections 406.3.1 through 406.3.5.

407.1 General. Where operating or closing a hazardous materials storage, use, or handling facility subject to permits under Section 5001.5, or where required by the *fire code official*, the ~~The~~ provisions of Sections 407.2 through 407.7 shall be applicable. ~~where hazardous materials subject to permits under Section 5001.5 are located on the premises or where required by the fire code official.~~

CHAPTER 5 FIRE SERVICE FEATURES

501.3.1 Site safety plan. The *owner* or *owner*'s authorized agent shall be responsible for the development, implementation and maintenance of an approved written site safety plan in accordance with Section 3303.

504.1 Required access. Exterior doors and openings required by this code or the *International Building Code* shall be maintained ~~readily accessible~~ with ready access for emergency access by the fire department. An *approved* access walkway leading from fire apparatus access roads to exterior openings shall be provided where required by the *fire code official*.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the stairway continues to the roof. Where ~~roofs are used for roof gardens landscaped roofs~~ or the roof is a *vegetative roof*, includes a *landscaped roof* area, or is used for other purposes, stairways shall be provided as required for such occupancy classification.

[NY] 505.1 Address identification. New and existing buildings shall be provided with *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 4 inches (102 mm) high with a minimum stroke width of 1/2 inch (12.7 mm). Where required by the *fire code official*, address identification shall be provided in additional *approved* locations to facilitate emergency response. Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole or other sign or means shall be used to identify the structure. Address identification shall be maintained.

> **Exception:** Buildings subject to address identification requirements ~~identified under an addressing scheme~~ as part of a countywide 911 numbering system that allows first responders to identify the address when responding.

508.1 General. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code* and in all F-1 and S-1 Occupancies with a building footprint of over 500,000 square feet, a *fire command center* for fire department operations shall be provided and shall comply with Sections 508.1.1 through ~~508.1.6.~~508.1.7

508.1.1 Location and access. The location and ~~accessibility of~~ access to the *fire command center* shall be approved by the fire code official.

508.1.3 Size. The *fire command center* shall be not less than 0.015 percent of the total building area of the facility served or 200 square feet (19 m^2) in area, whichever is greater, with a minimum dimension of 0.7 times the square root of the room area or 10 feet (3048 mm), whichever is greater.

Where a *fire command center* is required for Group F-1 and S-1 occupancies with a building footprint greater than 500,000 square feet in area the *fire command center* shall have a minimum size of 96 square feet (9 m^2) with a minimum dimension of 8 feet (2348 mm) where approved by the fire code official.

508.1.6 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 *interior exit 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 fighter air replenishment system, 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), and the estimated building population during the day, night and weekend.

13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager and building engineer and their respective work phone number, cell phone number, e-mail address.

13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns, and roof assembly.

13.4. Exit access and exit stairway information that includes: number of exit access and exit stairways in the building, each exit access and exit stairway designation and floors served, location where each exit access and exit stairway discharges, interior exit stairways that are pressurized, exit stairways provided with emergency lighting, each exit stairway that allows reentry, exit stairways 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, control rooms and control spaces; 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: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of automatic sprinkler systems installed including, but not limited to, dry, wet and pre-action.

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/CSA B44.

18. Elevator emergency or standby power selector switch(es), ~~where emergency or standby power is provided~~ in accordance with ASME A17.1/CSA B44

508.1.7 Fire command center identification. The *fire command center* shall be identified by a permanent easily visible sign stating "Fire Command Center" located on the door to the *fire command center*.

509.1 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~~ *fire protection systems* shall be identified for the use of the fire department. *Approved* signs required to identify *fire protection system* equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

509.2 Equipment access. *Approved* access shall be provided and maintained for all *fire protection system* equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from ~~being readily accessible~~ ready access.

SECTION 510
EMERGENCY RESPONDER ~~RADIO COVERAGE~~ COMMUNICATIONS ENHANCEMENT SYSTEMS

510.1 Emergency responder ~~radio coverage~~ communications enhancement systems in new buildings. ~~New buildings shall have~~ Approved in-building, ~~approved radio coverage~~ emergency responder communications enhancement system (ERCES) for emergency responders shall be provided in all new buildings. In-building ERCES within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. The ERCES, where required, shall be of a type determined

by the *fire code official* and the *frequency license holder(s).* This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* ~~radio~~ communications coverage system.
2. Where it is determined by the *fire code official* that the ~~radio~~ communications coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder ~~radio~~ communications coverage system.

4. One-story buildings not exceeding 12,000 square feet (1115 m^2) with no below-ground area(s).

510.2 ~~Reserved~~ Emergency responder communication enhancement system coverage in existing buildings. Existing buildings shall be provided with *approved* in-building, emergency responder communications enhancement system for emergency responders as required in Chapter 11.

510.3 Permits. Permits for in-building, two-way emergency responder communications coverage systems shall be in accordance with Sections 510.3.1 and 510.3.2.

~~**510.3**~~ **510.3.1 ~~Construction~~ permit required.** A construction ~~building~~ permit for the installation of or modification to in-building emergency responder ~~radio~~ communications enhancement ~~coverage~~ systems and related equipment is required as specified in Section 105.6.~~4~~5. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.3.2 Operational permit. Where required by the *fire code official*, an operational permit shall be issued for the operation of an in-building emergency responder communications coverage system.

510.4 Technical requirements. Equipment required to provide in-building, emergency responder communication enhancement system shall be listed in accordance with UL 2524. Systems, components and equipment required to provide the in-building emergency responder ~~radio~~ communications enhancement ~~coverage~~ system shall comply with Sections 510.4.1 through 510.4.2.8.

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have an acceptable in-building, emergency responder communication enhancement system ~~coverage when~~ where signal strength measurements in 95 percent of all areas and 99 percent of areas designated as *critical areas* by the *fire code official* on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

510.4.1.1 Minimum signal strength into the building. The minimum ~~inbound~~ *downlink* signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The ~~inbound~~ *downlink* signal level shall be sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 throughout the coverage area using either narrowband analog, digital or wideband LTE signals or an equivalent Bit Error Rate (BER) or Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. The minimum ~~outbound~~ *uplink* signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The ~~outbound~~ *uplink* signal level shall be sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 using either narrowband analog, digital or wideband LTE digital signals or an equivalent Bit Error Rate (BER) or an equivalent Signal-to-Interference-Plus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.2 System design. The in-building emergency responder ~~radio~~ communications enhancement ~~coverage~~ system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1225 ~~1221~~.

510.4.2.1 Amplification systems and components. Buildings and structures that cannot support the required level of in-building emergency responder communications ~~radio coverage~~ system shall be equipped with systems and

components to enhance the ~~public safety~~ radio signals and achieve the required level of ~~radio~~ in-building emergency responder communications ~~coverage~~ enhancement system specified in Sections 510.4.1 through 510.4.1.3. ~~Public safety communications enhancement~~ In-building emergency responder communications enhancement systems utilizing radio-frequency-emitting devices and cabling shall be approved by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

510.4.2.2 Technical criteria. The *fire code official* shall maintain a document providing the specific technical information and requirements for the inbuilding emergency responder communications ~~coverage~~ enhancement system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.

510.4.2.3 Standby power. In-building emergency responder communications enhancement ~~radio coverage~~ systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the in-building emergency responder communications ~~radio~~ ~~coverage~~ enhancement system at 100-percent system capacity for a duration of not less than 12 hours.

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a ~~National Electrical Manufacturer's Association (NEMA) 4-type waterproof~~ NEMA Type 4 cabinet.

2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet.

3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.

5. ~~Bi-Directional Amplifiers (BDAs)~~ Active RF-emitting devices used ~~in~~ for in-building emergency responder communications ~~radio~~ ~~coverage~~ enhancement systems shall have ~~oscillation prevention~~ built-in oscillation detection and control circuitry to reduce gain and maintain operation. When a signal booster detects oscillation, a supervisory signal shall be transmitted. In the event of uncorrectable oscillation, the system shall be permitted to shut down.

6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building emergency responder ~~radio coverage~~ communications enhancement system network~~s~~ shall be coordinated and approved by the fire code official and the frequency license holder(s).

510.4.2.5 System monitoring. The in-building emergency responder communications ~~radio~~ enhancement system shall be monitored by a *listed fire alarm control unit*, or where *approved* by the *fire code official*, shall sound an audible signal at a constantly attended on-site location. Automatic supervisory signals shall include the following:

1. Loss of normal AC power supply.

2. System battery charger(s) failure.

3. Signal source ~~M~~malfunction ~~of the donor antenna(s)~~.

4. Failure of active RF-emitting device(s).

5. Low-battery capacity at 70-percent of the 12-hour operating capacity has been depleted ~~reduction of operating capacity~~.

6. Failure of critical system components.

7. The communications link between the *fire alarm system* and the in-building emergency responder ~~radio~~ communications enhancement system.

8. Oscillation of active RF-emitting device(s).

510.4.2.5.1 Single supervisory input. Where *approved*, a single supervisory input to the *fire alarm system* to monitor all system supervisory signals shall be permitted.

510.4.2.6 Additional frequencies and change of frequencies. The in-building emergency responder ~~radio~~ communication ~~coverage~~ enhancement system shall be capable of modification or expansion in the event frequency

changes are required by the FCC or other ~~radio~~ frequency licensing authorities ~~authority~~, or additional frequencies are made available by the FCC or other ~~radio~~ frequency licensing authorities. ~~authority~~

510.4.2.7 Design documents. The *fire code official* shall have the authority to require "as-built" design documents and specifications for in-building emergency responder communications ~~coverage~~ enhancement systems. The documents shall be in a format acceptable to the *fire code official*.

510.4.2.8 Near Far Effect. ~~Radio communication antenna density~~. ~~Systems shall be engineered to minimize the near-far effect. In-building, two-way emergency responder communication coverage system designs shall include sufficient antenna density to address reduced gain conditions.~~ Where a signal booster is required by the RF system designer, the dynamic range of the in-building emergency responder communications enhancement system shall be designed to minimize the *effects* of strong signal automatic gain control on weak signal *uplink* performance, near-far effect.

Exceptions:

Class A narrow band signal booster devices with independent AGC/ALC circuits per channel.

Systems where all portable devices within the same band use active power control features.

510.4.2.9 Noise Interference. Where a signal booster is used, signal booster type(s) and the uplink signal and noise levels shall be coordinated with and *approved* by all *frequency license holder(s)* that may be adversely impacted by any transmitted noise resulting from the in-building emergency responder communications enhancement system. Systems shall be in compliance with all *frequency licensing authority* requirements.

510.5 Installation requirements. The installation of the ~~pubic safety radio~~ in-building emergency responder communications ~~coverage~~ enhancement system shall be in accordance with NFPA 1225 ~~1221~~ and Sections 510.5.2 through 510.5.~~4~~5.

510.5.1 Mounting of the donor antenna(s). To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the building or where approved, mounted on a movable sled with a clearly visible sign stating "MOVEMENT OR REPOSITIONING OF THIS ANTENNA IS PROHIBITED WITHOUT APPROVAL FROM THE FIRE CODE OFFICIAL." The antenna installation shall be in accordance with the applicable requirements in the *International Building Code* for weather protection of the building envelope.

510.5.2~~1~~ Approval prior to installation. ~~Amplification~~ Communications enhancement systems capable of operating on frequencies licensed to any public safety *agency* by the FCC or other *frequency ~~radio~~ licensing authority* shall not be installed or activated without prior coordination and approval of the *fire code official* and the *frequency license holder*.

510.5.2.1 Active RF-Emitting Devices. Active RF-emitting devices shall meet the following requirements in addition to any other requirements determined by the *fire code official* or the *frequency license holder(s)*:

1. Active RF-emitting devices that have a transmitted power output sufficient to require certification of the *frequency licensing authority* shall have the certification of the radio *frequency licensing authority* prior to installation.
2. All active RF-emitting devices shall be simultaneously compatible for their intended use, as required by the *frequency licensing authority*, the *frequency license holder(s)*, and the *fire code official*, at the time of installation.
3. Written authorization shall be obtained from the *frequency license holder(s)* prior to the initial activation of any RF-emitting devices required to be certified by the *frequency licensing authority*.

510.5.3~~2~~ **Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

1. A valid FCC-issued general radio operators license.

2. Certification of in-building system training issued by an *approved* organization or *approved* school, or a certificate issued by the manufacturer of the equipment being installed.

These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the *fire code official* is provided.

510.5.43 Acceptance test procedure. Where an in-building emergency responder ~~radio~~ communications ~~coverage~~ enhancement system is required, and upon completion of installation, the building owner shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows or by a method *approved* by the *fire code official*:

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system or equipment approved by the *fire code official*.

3. Failure of more than one test area shall result in failure of the test.

4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.

5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public *agency*'s radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.

6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.

7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.

8. Systems ~~incorporating Class B signal booster devices or Class B broadband fiber remote devices~~ shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

510.5.54 FCC compliance. The in-building emergency responder ~~radio~~ communications ~~coverage~~ enhancement system installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219.

510.6 Maintenance. The in-building emergency responder ~~radio~~ communications ~~coverage~~ enhancement system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.4.

510.6.1 Testing and proof of compliance. The *owner* of the building or *owner*'s authorized agent shall have the in-building emergency responder communications ~~radio~~ ~~coverage~~ enhancement system inspected and tested annually or where structural changes occur, including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section 510.5.4.

2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.

3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

4. All ~~other~~ active components shall be checked to verify operation within the manufacturer's specifications.

At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.4, shall be submitted to the *fire code official*.

510.6.2 Additional frequencies. The building owner shall modify or expand the in-building emergency responder ~~radio~~ communications ~~coverage~~ enhancement system at ~~his or her~~ their expense in the event *frequency* changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority. Prior approval of ~~a public safety radio~~ an in-building emergency responder ~~radio~~ communications ~~**coverage**~~ enhancement system on previous frequencies does not exempt this section.

510.6.3 Nonpublic safety system. Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the in-building emergency responder ~~radio~~ communications ~~coverage~~ enhancement system, the nonpublic safety amplification system shall be corrected or removed.

510.6.4 Field testing. *Agency* personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.

CHAPTER 6 BUILDING SERVICES AND SYSTEMS

601.1 Scope. The provisions of this chapter shall apply to the installation, operation, testing and maintenance of ~~fuel~~ the following building services and systems:

1. Electrical systems, equipment and wiring.
2. Information technology server rooms.
3. Elevator systems, emergency operation and recall.
4. Fuel-fired appliances ~~and~~ heating systems, ~~electrical systems and equipment, mechanical refrigeration systems, elevator recall and commercial kitchen equipment.~~ chimneys and fuel oil storage
5. Commercial cooking equipment and systems.
6. Commercial cooking oil storage.
7. Mechanical refrigeration systems.
8. Hyperbaric facilities.
9. Clothes dryer exhaust systems.

~~**[NY]601.2 Permits.** Permits shall be obtained for refrigeration systems, battery systems and solar photovoltaic power systems as set forth in Sections 105.2 and 105.6.~~

601.2 Hazard abatement. Operations or conditions deemed unsafe or hazardous by the *fire code official* shall be abated. Equipment, appliances, materials, and systems that are modified or damaged and constitute an electrical shock or fire hazard shall not be used.

601.2.1 Correction of unsafe conditions. The *fire code official* shall be authorized to require the owner, the owner's authorized agent, operator or occupant of a building or premises to abate or cause to be abated or corrected such unsafe operations or conditions either by repair, rehabilitation, demolition or other *approved* corrective action in compliance with this code.

602.1 Definitions.

The following terms are defined in Chapter 2:

COMMERCIAL COOKING APPLIANCES.

~~CRITICAL CIRCUIT.~~

HOOD.

•Type I.

•~~Type II.~~

REFRIGERANT.

REFRIGERATING (REFRIGERATION) SYSTEM.

~~SECTION 604~~603
ELECTRICAL EQUIPMENT, WIRING AND ~~HAZARDS~~ SYSTEMS

603.1 General. Electrical equipment, wiring and systems required by this code or the *International Building Code* shall be installed, used and maintained in accordance with NFPA 70 and Sections 603.2 through 603.10.

~~**604.7**~~ **603.1.1 Equipment and wiring.** All electrical equipment, wiring, devices and appliances ~~and fixtures~~ shall be tested; ~~and~~ listed and labeled ~~by an approved agency;~~ and installed, used and maintained in accordance with NFPA 70 and all instructions included as part of such listing.

603.1.2 Healthcare facilities. In Group I-2 facilities, ambulatory care facilities and outpatient clinics, the electrical systems and equipment shall be maintained and tested in accordance with NFPA 99.

~~**604.1**~~ **603.2 Abatement of unsafe conditions and electrical hazards.** ~~Identified electrical hazards shall be abated. Identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the responsible building official. Electrical wiring, devices, appliances and other equipment that is modified or damaged and constitutes~~ Conditions that constitute an electrical shock or fire hazard shall ~~not~~ be ~~used~~ abated.

603.2.1 Modified or damaged. Electrical wiring, devices, appliances and equipment that are modified or damaged, and constitute an electrical shock or fire hazard, shall not be used until repaired or replaced in accordance with this code and NFPA 70.

~~**604.6**~~ **603.2.2~~Unapproved conditions.~~ Open electrical terminations.** Open junction boxes and open-wiring splices shall be prohibited. Approved covers shall be provided for all switch and electrical outlet boxes.

~~**604.2**~~ **603.3 Illumination –** text unchanged so not included for brevity

603~~4~~.3 Working space and ~~clearance~~ clearances. ~~A working space of not~~ Working space around electrical equipment shall be provided in accordance with Section 110.26 of NFPA 70 for electrical equipment rated 1000 volts or less, and Section 110.32 of NFPA 70 for electrical equipment rated over 1000 volts. The minimum required working space shall not be less than 30 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height ~~shall be provided~~ in front of electrical service equipment. Where the electrical service equipment is wider than 30 inches (762 mm), the minimum working space shall be not less than the width of the equipment. Storage of materials shall not be located within the designated working space.

> ~~**Exceptions:**~~
>
> ~~1.Where other dimensions are required or allowed by NFPA 70.~~
>
> ~~2.Access openings into attics or under-floor areas that provide a minimum clear opening of 22 inches (559 mm) by 30 inches (762 mm).~~

603.4.1 ~~Labeling~~ Electrical room marking. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating "ELECTRICAL ROOM" or similar *approved* wording.

~~The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.~~

603.4.2 Disconnect means marking. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

603.4.3 Multiple supply connections marking. Where buildings or structures are supplied by more than one power source, markings shall be provided at each service equipment location and at all interconnected electric power production sources identifying all electric power sources at the premises in accordance with NFPA 70.

~~**604.4**~~**603.5 Relocatable power taps and current taps.** ~~**Multiplug adapters.** Multiplug adapters, such as cube adapters, unfused plug strips or any other device not complying with NFPA 70 shall be prohibited.~~ The construction and use of current taps and relocatable taps shall be in accordance with NFPA 70 and this code.

603.5.1 ~~**604.4.1 Power Tap Design**~~ **Listing**. Relocatable power taps shall be ~~of the polarized or grounded type, equipped with overcurrent protection, and shall be~~ listed and *labeled* in accordance with UL 1363. Relocatable power taps attached to furnishings shall be *listed* and *labeled* in accordance with UL 962A. Current taps shall be *listed* and *labeled* in accordance with UL 498A.

603.5.1.1 Listing in Group I-2 occupancies and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, relocatable power taps shall be *listed* and *labeled* in accordance with UL 1363 except under the following conditions:

1. In Group I-2, Condition 2 occupancies, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.

2. In Group I-2, Condition 1 facilities, in care recipient rooms using line-operated patient care-related electrical equipment, relocatable power taps in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.

3. In ambulatory care facilities, relocatable power taps providing power to patient care-related electrical equipment in the patient care vicinity, as defined by NFPA 99, shall be *listed* and *labeled* in accordance with UL 1363A or UL 60601-1.

~~**604.4.2**~~ **603.5.2 Application and use** ~~**Power supply**~~. Relocatable power taps and current taps shall be directly connected to a permanently installed receptacle.

Exceptions:

1.Where approved for use in a Group A Occupancy or in a meeting room in a Group B Occupancy, no more than five relocatable power taps shall be permitted to be connected together or connected to an extension cord for temporary use to supply power to electronic equipment.

2.Current taps and relocatable power taps shall not be required to connect directly to a permanently installed receptacle outlet where used for 90 days or less for the purpose of testing the performance of such devices.

~~**604.4.3**~~ **603.5.3 Installation –** text unchanged so not included for brevity

~~**604.5**~~ **603.6 Extension cords.** Extension cords ~~and flexible cords~~ shall not be a substitute for permanent wiring and shall be *listed* and *labeled* in accordance with UL 817. Extension cords ~~and flexible cords~~ shall not be affixed to structures, extended through walls, ceilings or floors, or under doors or floor coverings, nor shall such cords be subject to environmental damage or physical impact. Extension cords shall be used only with portable appliances. Extension cords marked for indoor use shall not be used outdoors.

~~**604.5.1**~~ **603.6.1** ~~**Power supply.**~~ **Application and use.** Extension cords shall be plugged directly into an approved receptacle, relocatable power tap or ~~multiplug adapter~~ current tap, and, except for approved multiplug extension cords, shall serve only one portable appliance.

~~**604.5.2**~~ **603.6.2 Ampacity.** The ampacity of the extension cords shall be not less than the rated ~~capacity~~ ampacity of the portable appliance supplied by the cord.

~~**604.5.3**~~ **603.6.3 Maintenance** – text unchanged so not included for brevity

~~**604.5.4**~~ **603.6.4 Grounding.** Extension cords shall contain an equipment grounding conductor ~~be grounded~~ where serving ~~grounded~~ portable appliances required to be connected to an equipment grounding conductor.

603.8 ~~**604.9**~~ **Temporary wiring.** ~~Temporary~~ The use of temporary wiring for electrical power and lighting installations ~~is allowed for~~ shall not exceed a period ~~not to exceed~~ of 90 days. Temporary wiring methods shall meet the applicable provisions of NFPA 70.

Exception: Temporary wiring for electrical power and lighting installations ~~is allowed~~ complying with the applicable provisions of NFPA 70 is permitted during periods of construction, remodeling, repair or demolition of buildings, structures, equipment or similar activities.

~~**604.9.1**~~ **603.8.1 Attachment to structures.** Temporary wiring attached to a structure shall be ~~attached in an approved manner.~~ protected from physical damage and supported on insulators spaced not more than 10 ft. (3.0 m) apart.

SECTION ~~606~~604
~~ELEVATOR OPERATION, MAINTENANCE AND FIRE SERVICE KEYS~~ ELEVATORS

604.1 General. Where elevators and conveying systems are installed, they shall comply with Chapter 30 of the International Building Code and Sections 604.2 through 604.7

~~**606.1**~~ **604.2** ~~**Emergency operation.**~~ Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in Chapter 11of this code. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44.

~~**606.2**~~**604.3 Standby power.** In buildings and structures where standby power is required or furnished to operate an elevator, standby power shall be provided in accordance with Section 1203~~.~~ of this code. Operation of the system shall be in accordance with Sections ~~606.2.1~~604.3.1 through ~~606.2.4~~ 604.3.4.

~~**606.2.1**~~**604.3.1 Manual transfer.** Standby power shall be manually transferable to all elevators in each bank.

~~**606.2.2**~~**604.3.2 One elevator.** Where only one elevator is installed, the elevator shall automatically transfer to standby power within 60 seconds after failure of normal power.

~~**606.2.3**~~**604.3.3 Two or more elevators.** Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time. Where the standby power source is not of sufficient capacity to operate all elevators at the same time, all elevators shall transfer to standby power in sequence, return to the designated landing and disconnect from the standby power source. After all elevators have been returned to the designated level, not less than one elevator shall remain operable from the standby power source.

~~**606.2.4**~~**604.3.4 Machine room ventilation.** Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

[BE] ~~**606.3**~~**604.4 Emergency signs.** A ~~An *approved*~~ pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit *stairways* and not to use the elevators in case of fire. Where elevators are not a component of the *accessible means of egress* the ~~The~~ sign shall read: "IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE. USE EXIT ~~STAIRS~~." Where the elevator is a component of the accessible means of egress a sign complying with Section 1009.11 shall be provided.

~~**Exceptions**~~ **Exception:**

1. ~~The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1009.4.~~
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008 of the International Building Code.

604.5 Maintenance of elevators. Elevator features and lobbies required by Section 3006 of the *International Building Code* shall be inspected, tested and maintained and in accordance with Sections 604.5.1 thru 604.5.4.

~~**606.4**~~**604.5.1 Fire service access elevators and lobbies.** Where fire service access elevators are required by Section 3007 of the International Building Code, the fire service access elevator fire protection and safety features required by Section 3007 of the International Building Code shall be maintained and lobbies shall be maintained free of storage and furniture.

~~**606.5**~~ **604.5.2 Occupant evacuation elevators and lobbies.** Where occupant evacuation elevators are provided in accordance with Section 3008 of the International Building Code, the occupant evacuation elevator fire protection and safety features and lobbies required by Section 3008 of the International Building Code shall be maintained free of storage and furniture.

604.5.3 Storage within elevator lobbies. Where hoistway opening protection is required by Section 3006.2 of the International Building Code, elevator lobbies shall be maintained free of storage.

~~**606.6**~~ **604.5.4 Water protection of hoistway enclosures.** Methods to prevent water from infiltrating into a hoistway enclosure required by Section 3007.3 and Section 3008.3 of the International Building Code shall be maintained.

604.6 Elevator keys. All elevators shall be provided with elevator car door and fire-fighter service keys in accordance with Sections 604.6.1 thru 604.6.2.4.

~~606.7~~**604.6.1 Elevator key location.** Keys for the elevator car doors and fire-fighter service keys shall be kept in an *approved* location for immediate use by the fire department.

~~606.8~~**604.6.2 Standardized fire service elevator keys.** Buildings with elevators equipped with Phase I emergency recall, Phase II emergency in-car operation, or a fire service access elevator shall be equipped to operate with a standardized fire service elevator key *approved* by the *fire code official* or a standardized key in accordance with ASME A17.1/CSA B44 .

> **Exception:** The *owner* shall be permitted to place the building's nonstandardized fire service elevator keys in a key box installed in accordance with Section 506.1.2.

~~606.8.1~~**604.6.2.1 Requirements for standardized fire service elevator keys.** Standardized fire service elevator keys shall comply with all of the following:

1. All fire service elevator keys within the jurisdiction shall be uniform and ~~specific for the jurisdiction~~ approved in accordance with Section 604.6.2. Keys shall be cut to a uniform key code.
2. Fire service elevator keys shall be of a patent-protected design to prevent unauthorized duplication.
3. Fire service elevator keys shall be factory restricted by the manufacturer to prevent the unauthorized distribution of key blanks. Uncut key blanks shall not be permitted to leave the factory.
4. Fire service elevator keys subject to these rules shall be engraved with the words “DO NOT DUPLICATE.”

~~606.8.2~~**604.6.2.2 Access to standardized fire service keys.** Access to standardized fire service elevator keys shall be restricted to the following:

1. Elevator owners or their authorized agents.
2. Elevator contractors.
3. Elevator inspectors of the jurisdiction.
4. *Fire code officials* of the jurisdiction.
5. The fire department and other emergency response agencies designated by the fire code official.

~~606.8.3~~**604.6.2.3 Duplication or distribution of keys.** A person shall not duplicate a standardized fire service elevator key or issue, give, or sell a duplicated key unless in accordance with this code.

~~606.8.4~~**604.6.2.4 Responsibility to provide keys.** The building *owner* shall provide up to three standardized fire service elevator keys where required by the *fire code official*, upon installation of a standardized fire service key switch or switches in the building.

604.7 Storage. Storage is prohibited in elevator cars or elevator machine rooms.

> **Exceptions:**
>
> 1. Blankets used for protection of elevator cab walls during construction or renovation.
> 2. Materials necessary for the operation and maintenance of the elevator equipment

~~SECTION 603~~605
FUEL-FIRED APPLIANCES AND SYSTEMS

~~603.1~~**605.1 General.** The design, construction, installation, operation, alteration, repair and maintenance of nonportable gas-fired appliances and systems shall comply with the provisions of this section and the *International Fuel Gas Code*. The design, construction, installation ~~of nonportable liquid fuelfired~~, operation, alteration, repair and maintenance of nonportable solid fuel-fired and oil-fired appliances and systems shall comply with the provisions of this section and the *International Mechanical Code*. ~~The installation of all other fuel-fired appliances , other than portable internal combustion engines, oil lamps and other portable devices such as blow torches, melting pots and weed burners, shall comply with this section and the International Mechanical Code~~ .

~~603.1.1~~605.1.1 ~~**Manufacturer's instructions**~~ **Installation of nonportable fuel-fired appliances.** The installation of nonportable fuel-fired appliances shall be made in accordance with the manufacturer's installation instructions and applicable federal, state and local rules and regulations. ~~Where it becomes necessary to change, modify or alter a manufacturer's instructions in any way, written approval shall first be obtained from the manufacturer.~~

[NY]605.1.1.1 ~~**603.10**~~ **Solid fuel-burning heating appliances, chimneys and flues.** ~~Building~~ Construction permits, inspection requirements, and compliance certificates for the installation, inspection, and subsequent use of solid fuel-burning heating appliances, chimneys and flues shall be in accordance with Section 113 of the *Fire Code of New York State*.

~~**603.1.2 Approval.** The design, construction and installation of fuel-fired appliances shall be in accordance with the International Fuel Gas Code and the International Mechanical Code~~

~~603.1.3~~605.1.2 **Electrical wiring and equipment.** Electrical wiring and equipment used in connection with ~~oil~~fuel-~~burning~~ fired appliances and equipment shall be installed and maintained in accordance with Section 604 and NFPA 70.

~~603.1.4~~605.1.3 **Fuel oil.** The grade of fuel oil used in ~~a~~ an oil burner shall be that for which the oil burner is approved and as stipulated by the oil burner ~~manufacturer.~~ manufacturer's instructions. Oil containing gasoline shall not be used. Waste crankcase oil shall be an acceptable fuel in Group F, M and S occupancies where utilized in equipment *listed* and *labeled* for use with waste oil and where such equipment is installed in accordance with the manufacturer's instructions and the terms of its listing

~~603.1.5~~605.1.4 **Access.** The installation of fuel fired equipment shall be provided with access to equipment for cleaning hot surfaces; removing burners; replacing motors, controls, air filters, chimney and vent connectors, draft regulators and other working parts; and for adjusting, cleaning and lubricating parts.

~~603.1.6~~605.1.5 **Testing, diagrams and instructions.** After installation of the ~~oil~~fuel-~~burning~~ fired equipment, operation and combustion performance tests shall be conducted to determine that the ~~burner~~ equipment is in proper operating condition and that all accessory equipment, controls, and safety devices function properly.

~~603.1.6.1~~605.1.5.1 **Diagrams.** Contractors installing industrial oil-burning systems shall furnish not less than two copies of diagrams showing the main oil lines and controlling valves, one copy of which shall be posted at the oil-burning equipment and another at an approved location that will be available in case of emergency.

~~603.1.6.2~~ 605.1.5.2~~**Instructions**~~**Operating instructions.** After completing the installation, the installer shall instruct the owner or operator in the proper operation of the equipment. The installer shall furnish the *owner* or operator with the ~~name and telephone number of persons to contact for technical information or assistance and routine or emergency services~~ manufacturer's operating instructions.

~~603.1.7~~605.1.6 **Clearances.** Working clearances between ~~oil~~fuel-fired appliances and electrical panelboards and equipment shall be in accordance with NFPA 70. Clearances between oil-fired equipment and oil supply tanks shall be in accordance with NFPA 31

~~603.7~~605.2~~**Discontinuing operation**~~ **Abatement of unsafe ~~heating appliances~~ conditions.** The *fire code official* is authorized to order that measures be taken to prevent the operation of any existing stove, oven, furnace, incinerator, boiler or any other heat-producing device or appliance found to be defective or in violation of code requirements for existing appliances after giving notice to this effect to any person, *owner*, firm or agent or operator in charge of the same. The *fire code official* is authorized to take measures to prevent the operation of any device or appliance without notice when inspection shows the existence of an immediate fire hazard or when imperiling human life. The defective device shall remain withdrawn from service until all necessary repairs or alterations have been made or replaced in accordance with Section 605.1.

~~603.6~~605.2.1 **Chimneys and appliances.** Chimneys, vents, incinerators, smokestacks or similar devices for conveying smoke or hot gases to the outer air and the appliances, such as stoves, furnaces, fireboxes or boilers to which such devices are connected, shall be maintained so as not to create a fire hazard.

~~603.6.1~~605.2.1.1 **Masonry chimneys.** Masonry chimneys that, upon inspection, are found to be without a flue liner and that have open mortar joints which will permit smoke or gases to be discharged into the building, or which are cracked as to be dangerous, shall be repaired or relined with a listed chimney liner system installed in accordance with

the manufacturer's instructions and the *International Mechanical Code*, or a flue lining system installed in accordance with the requirements of the International Building Code and appropriate for the intended class of chimney service.

~~603.6.2~~605.2.1.2 **Metal chimneys.** Metal chimneys that are corroded or improperly supported shall be repaired or replaced in accordance with the *International Mechanical Code*.

~~603.6.3~~605.2.1.3 **Decorative shrouds.** Decorative shrouds installed at the termination of factory-built chimneys or vents shall be removed except where such shrouds are listed and labeled for use with the specific factory-built chimney system and are installed in accordance with the chimney or vent manufacturer's instructions and the International Mechanical Code or International Fuel Gas Code.

~~603.6.4~~605.2.1.4 **Factory-built chimneys and vent systems.** Existing factory-built chimneys and vent systems that are damaged, corroded or improperly supported shall be repaired or replaced in accordance with the International Mechanical Code.

~~603.6.5~~605.2.1.5 **Connectors.** Existing chimney and vent connectors that are damaged, corroded or improperly supported shall be repaired or replaced in accordance with the International Mechanical Code.

~~603.2~~605.3 **Chimneys and vents.** Masonry chimneys shall be constructed in accordance with the International Building Code. Factory-built chimneys and vent systems serving solid-fuel-fired appliances or oil-fired appliances shall be installed in accordance with the International Mechanical Code. Metal chimneys shall be constructed and installed in accordance with ~~NFPA 211~~ the International Mechanical Code. Factory-built chimneys and vent systems serving gas-fired appliances shall be installed in accordance with the International Fuel Gas Code.

605.4~~603.3~~ **Fuel oil storage systems.** Fuel oil storage systems shall be installed and maintained in accordance with this code. ~~Fuel oil~~ Tanks and fuel-oil piping systems shall be installed in accordance with Chapter 13 of the International Mechanical Code.

~~603.3.1~~ 605.4.1 **Fuel oil storage in outside, above-ground tanks.** Where connected to a fuel-oil piping system, the maximum amount of fuel oil storage allowed outside above ground without additional protection shall be 660 gallons (2498 L). The storage of fuel oil above ground in quantities exceeding 660 gallons (2498 L) shall comply with NFPA 31.

605.4.1.1 Approval. Outdoor fuel oil storage tanks shall be in accordance with UL 80, UL 142, UL 142A or UL 2085.

~~603.3.2~~ 605.4.2 **Fuel oil storage inside buildings.** Fuel oil storage inside buildings shall comply with Sections 605.4.2.2 through 605.4.2.8 or Chapter 57 of this code.

~~603.3.2~~605.4.2.1 **Approval**. Indoor fuel oil storage tanks shall be in accordance with UL 80, UL 142, UL 142A or UL 2085.

~~603.3.2~~605.4.2.2 **Quantity limits.** One or more fuel oil storage tanks containing Class II or III combustible liquid shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142, UL 142A or UL 2085.

2. 1,320 gallons (4996 L) in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142 or UL 142A. The tank shall be listed as a secondary containment tank, and the secondary containment shall be monitored visually or automatically.

3. 3,000 gallons (11 356 L) in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7. ~~and the room is protected by an automatic sprinkler system in accordance with Section 903.3.1.1~~The tank shall be listed as a secondary containment tank, as required by UL 2085, and the secondary containment shall be monitored visually or automatically.

~~603.3.2.2~~605.4.2.3 **Restricted use and connection.** Tanks installed in accordance with Section 605.4.2 shall be used only to supply fuel oil to fuel-burning equipment, generators or fire pumps installed in accordance with Section 605.4.2.5. Connections between tanks and equipment supplied by such tanks shall be made using closed piping systems in accordance with the International Mechanical Code.

~~603.3.2.3~~ 605.4.2.4 **Applicability of maximum allowable quantity and control area requirements.** The quantity of combustible liquid stored in tanks complying with Section 603.3.2 shall not be counted towards the maximum allowable quantity set forth in Table 5003.1.1(1), and such tanks shall not be required to be located in a control area.

~~603.3.2.4~~ 605.4.2.5 **Installation.** Tanks and piping systems shall be installed in accordance with Section 915 and Chapter 13, both of the International Mechanical Code, as applicable.

~~603.3.2.5~~ 605.4.2.6**Separation.** Rooms containing fuel oil tanks for internal combustion engines shall be separated from the remainder of the building by fire barriers, horizontal assemblies, or both, with a minimum 1-hour fire-resistance rating with 1-hour fire-protection-rated opening protectives constructed in accordance with the International Building Code.

> **Exception:** Rooms containing protected above-ground tanks complying with Section 5704.2.9.7 shall not be required to be separated from surrounding areas.

~~603.3.2.6~~ 605.4.2.7 **Spill containment.** Tanks exceeding ~~55~~ 60 gallon (~~208~~ 227 L) capacity or an aggregate capacity of 1,000 gallons (3785 L) that are not provided with integral secondary containment shall be provided with spill containment sized to contain a release from the largest tank.

605.4.2.8 ~~603.3.2.7~~ **Tanks in basements.** Tanks in basements shall be located not more than two stories below grade plane.

~~603.3.3~~ 605.4.3~~Underground storage of fuel oil.~~ **Fuel oil storage in underground tanks.** The storage of fuel oil in underground storage tanks shall comply with UL 58 or UL 1316 and installed in accordance with NFPA 31 more than two stories below grade plane.

~~603.5~~ **605.5 Heating appliances.** Heating appliances shall be listed and shall comply with Sections 60~~3~~5.5.1 and 60~~3~~5.5.2.

NOTE: The following sections which were renumbered, but no changes were made to the content of the section, are shown as section titles only.

~~603.5.1~~ **605.5.1 Guard against contact.**

~~603.5.2~~ **605.5.2 Heating appliance installation and maintenance.**

~~603.7.1~~ **605.6 Unauthorized operation**

~~603.8~~ **605.7 Incinerators.**

~~603.8.1~~ **605.8.1 Residential incinerators.** Residential incinerators shall be ~~of an approved type.~~ listed and labeled in accordance with UL 791.

~~603.8.2~~ **605.7.2 Spark arrestor.**

~~603.8.3~~ **605.7.3 Restrictions.**

~~603.8.4~~ **605.7.4 Time of burning.**

~~603.8.5~~ **605.7.5 Discontinuance.**

~~603.8.6~~ **605.7.6 Flue-fed incinerators in Group I-2.**

~~603.8.7~~ **605.7.7 Incinerator inspections in Group I-2.**

~~603.9~~ **605.8 Gas meters.**

SECTION ~~607~~606
COMMERCIAL ~~KITCHEN HOODS~~COOKING EQUIPMENT AND SYSTEMS

606.3 Operations and maintenance. Commercial cooking systems shall be operated, inspected and maintained in accordance with Sections 606.3.1 through 606.3.4.

SECTION ~~608~~607
COMMERCIAL ~~KITCHEN~~COOKING OIL STORAGE

SECTION ~~605~~608
MECHANICAL REFRIGERATION

[M] 608.1 Scope. Refrigeration systems shall comply ~~be installed in accordance~~ with the *International Mechanical Code* and this section, as specified in Sections 608.1.1 and 608.1.2.

608.1.1 Refrigerants other than ammonia. Refrigeration systems using a refrigerant other than ammonia shall comply with Section 608 and ~~Where a refrigerant other than ammonia is used, refrigeration systems and the buildings in which such systems are installed shall be in accordance with~~ ASHRAE 15. Refrigeration systems containing carbon dioxide as the refrigerant shall also comply with IIAR CO2.

~~**605.1.2**~~ **608.1.2 Ammonia refrigeration.** Refrigeration systems using ammonia refrigerant ~~and the buildings in which such systems are installed~~ shall comply with IIAR 2 for system design ~~and installation~~;; IIAR 6 for inspection, testing and maintenance; ~~and~~ IIAR 7 for operating procedures~~. D~~ ; IIAR 8 for decommissioning ~~of ammonia refrigeration systems shall comply with IIAR 8~~, and IIAR 9 for engineering practices for existing ~~ammonia refrigeration systems shall be in accordance with IIAR 9~~ systems. Refrigeration systems using ammonia refrigerant shall not be required to comply with Section 608.

608.2 Permits. An operational permit shall be obtained for refrigeration systems as set forth in section 105.5.46.

608.9 Refrigerant detection. Machinery rooms shall be provided with a refrigerant detector with an audible and visible alarm. ~~Where ammonia is used as the refrigerant, detection shall comply with IIAR 2. For refrigerants other than ammonia, refrigerant detection shall comply with Section 608.9.1.~~ ~~**608.9.1 Refrigerants other than ammonia.**~~ A detector, or a sampling tube that draws air to a detector, shall be provided at an approved location where refrigerant from a leak is expected to accumulate. The system shall be designed to initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location where the concentration of refrigerant detected exceeds the lesser of the following:

1. The corresponding TLV-TWA values shown in the International Mechanical Code for the refrigerant classification.

2. Twenty-five percent of the lower flammable limit (LFL).

Detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 608.10.1.

~~**605.10**~~**608.11 Emergency pressure control system.** Permanently installed refrigeration systems in machinery rooms containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant ~~or ammonia~~ shall be provided with an emergency pressure control system in accordance with Sections ~~605.10.1~~ 608.11.1 and ~~605.10.2~~ 608.11.2.

608.12 Storage, use and handling. Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

Exceptions: These provisions shall not apply to:

1. ~~This provision shall not apply to~~ Spare parts, tools and incidental materials necessary for the safe and proper operation and maintenance of the system.
2. Refrigerant removed from equipment during a repair or replacement and temporarily stored in a pressure vessel complying with ASME BPVC Section VIII, for reuse after the repair or replacement has been completed.

608.13 Discharge and termination of pressure relief and purge systems. Pressure relief devices, fusible plugs and purge systems discharging to the atmosphere from refrigeration systems containing flammable, toxic or highly toxic refrigerants ~~or ammonia~~ shall comply with Sections 608.13.2 ~~through 608.13.4~~ and 608.13.3.

608.13.2 Flammable refrigerants. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6~~ 608.13.5. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is

located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.

608.13.3 Toxic and highly toxic refrigerants. Systems containing more than 6.6 pounds (3 kg) of toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section ~~608.13.5~~ 608.13.4 or a flaring system in accordance with Section ~~608.13.6~~ 608.13.5.

~~**608.13.4 Ammonia refrigerant.** Systems containing more than 6.6 pounds (3 kg) of ammonia refrigerant shall discharge vapor to the atmosphere in accordance with one of the following methods:~~

~~1. Directly to atmosphere where the fire code official determines, on review of an analysis prepared in accordance with Section 104.8.2, that a~~

~~health hazard would not result from atmospheric discharge of ammonia.~~

~~2. Through an approved treatment system in accordance with Section 608.13.5.~~

~~3. Through a flaring system in accordance with Section 608.13.6.~~

~~4. Through an approved ammonia diffusion system in accordance with Section 608.13.7.~~

~~5. By other approved means.~~

~~Exception: Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.~~

608.13.4 ~~608.13.5~~ **Treatment systems.** Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 60.

608.13.5 ~~608.13.6~~ **Flaring systems.** Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback and shall not expose structures or materials to threat of fire. Standby fuel, such as LP-gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system. Standby electrical power, where required to complete the incineration process, shall be in accordance with Section 1203.

~~**608.13.7 Ammonia diffusion systems.** Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (8.3 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but not lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.~~

608.14 Mechanical ventilation exhaust. Exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants, ~~other than ammonia,~~ capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be equipped with approved treatment systems to reduce the discharge concentrations to those values or lower.

Exception: Refrigeration systems containing Group A2L complying with Section 608.18.

[M] ~~**605.16**~~ 608.17 **Electrical equipment.** Where refrigerant of Groups A2, A3, B2 and B3, as defined in the International Mechanical Code, are used, refrigeration machinery rooms shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

~~**Exceptions:**~~

~~1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1101.1.2, Exception 1 of the International Mechanical Code.~~

~~2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 608.18.~~

~~**605.17Special requirements for Group A2L refrigerant machinery rooms.** Machinery rooms with systems containing Group A2L refrigerants shall comply with Sections 605.17.1 through 605.17.3. Exception: Machinery rooms conforming to the Class I, Division 2 hazardous location classification requirements of NFPA 70. the Class I,~~

~~Division 2, hazardous classification electrical requirements of NFPA 70, shall comply with Sections 608.18.1 through 608.18.2.~~

~~**605.17.1 Refrigerant detection system.** The machinery room shall be provided with a refrigerant detection system. The refrigerant detection system shall be in accordance with Section 605.8 and all of the following:~~

~~1.The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.~~

~~2.Upon activation, the detection system shall activate the emergency ventilation system in Section 605.17.3.~~

~~3.The detection, signaling and control circuits shall be supervised.~~

~~**[M] 605.17.2 Emergency ventilation system.** An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 605.17.2. Shut down of the emergency ventilation system shall be by manual means.~~

[M] 608.18 Group A2L and B2L refrigerant. Machinery rooms for Group A2L and B2L refrigerant shall comply with Sections 1106.4.1 through 1106.4.3 of the International Mechanical Code.

608.18.1 Elevated temperatures. Open flame-producing devices or continuously operating hot surfaces over 1,290°F (700°C) shall not be permanently installed in the room.

[M] 608.18.2 Refrigerant detector. In addition to the requirements of Section 1105.3 of the International Mechanical Code, refrigerant detectors shall signal an alarm and activate the ventilation system in accordance with the response time specified in Table 608.18.2.

~~**TABLE [M] 605.17.2 MINIMUM EXHAUST RATE**~~

~~REFRIGERANT~~	~~Q (m^3/sec)~~	~~Q (cfm)~~
~~R32~~	~~15.4~~	~~32,600~~
~~R143a~~	~~13.6~~	~~28,700~~
~~R444A~~	~~6.46~~	~~13,700~~
~~R444B~~	~~10.6~~	~~22,400~~
~~R445A~~	~~7.83~~	~~16,600~~
~~R446A~~	~~23.9~~	~~50,700~~
~~R447A~~	~~23.8~~	~~50,400~~
~~R451A~~	~~7.04~~	~~15,000~~
~~R451B~~	~~7.05~~	~~15,000~~
~~R1234yf~~	~~7.80~~	~~16,600~~
~~R1234ze(E)~~	~~5.92~~	~~12,600~~

~~**[M] 605.17.3 Emergency ventilation system discharge.** The point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.~~

TABLE 608.18.2 GROUP A2L AND B2L DETECTOR ACTIVATION

ACTIVATION LEVEL	MAXIMUM RESPONSE TIME (seconds)	ASHRAE 15 VENTILATION LEVEL	ALARM RESET	ALARM TYPE
Less than or equal to the OEL in Table 1103.1 of the International Mechanical Code	300	1	Automatic	Trouble
Less than or equal to the refrigerant concentration level in Table 1103.1 of the International Mechanical Code	15	2	Manual	Emergency

[M] 608.18.3 Mechanical ventilation. The machinery room shall have a mechanical ventilation system complying with ASHRAE 15.

SECTION 610

CLOTHES DRYER EXHAUST SYSTEMS

610.1 Clothes dryer exhaust duct systems. Clothes dryer exhaust duct systems shall be in accordance with Sections 610.1.1 and 610.1.2.

610.1.1 Installation. Clothes dryer exhaust duct systems shall be installed in accordance with the International Mechanical Code or the International Fuel Gas Code, and the manufacturer's installation instructions.

610.1.2 Maintenance. The lint trap, mechanical and heating components, and the exhaust duct system of a clothes dryer shall be maintained in accordance with the manufacturer's operating instructions to prevent the accumulation of lint or debris that prevents the exhaust of air and products of combustion.

CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES

701.6 Owner's responsibility. The *owner* shall maintain an inventory of all required *fire-resistance-rated* construction, construction installed to resist the passage of smoke and the construction included in Sections 703 through 707 and Sections 602.4.1 and 602.4.2 of the *International Building Code*. Such construction shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. ~~Records of inspections and repairs shall be maintained.~~ Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is ~~accessible~~ available by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space.

701.6.1 Recordkeeping. Records of all required system inspections, testing, repairs, and maintenance shall be maintained in accordance with Section 110.3.

703.2 Repair of Penetrations. Where damaged, materials used to protect membrane- and through-penetrations shall be replaced or restored with materials or systems that meet or exceed the code requirements applicable at the time when the assembly was constructed, remodeled or altered.

704.1 Maintaining protection. Where required when the building was originally constructed, materials and systems used to protect joints and voids in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction.

1. 1.Joints in or between *fire-resistance-rated* walls, floors or floor/ceiling assemblies and roof or roof/ceiling assemblies.
2. 2.Joints in *smoke barriers*.
3. 3.Voids at the intersection of a horizontal floor assembly and an exterior curtain wall.
4. 4.Voids at the intersection of a horizontal *smoke barrier* and an exterior curtain wall.

5. 5.Voids at the intersection of a nonfire-resistance-rated floor assembly and an exterior curtain wall.
6. 6.Voids at the intersection of a vertical *fire barrier* and an exterior curtain wall.
7. 7.Voids at the intersection of a vertical *fire barrier* and a nonfire-resistance-rated roof assembly.

Unprotected joints and voids do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturer's installation instructions.

704.2 Repair of Joints and Voids. Where damaged, materials used to protect joints and voids shall be replaced or restored with materials or systems that meet or exceed the code requirements applicable at the time when the assembly was constructed, remodeled or altered.

705.2.7 Periodic inspection and testing of rolling steel fire doors. Rolling steel *fire doors* shall be inspected and tested annually by a trained rolling steel *fire door* systems technician in accordance with the applicable provisions of NFPA 80. Records of inspections and testing shall be maintained.

707.1 Fireblocking and ~~draftstopping~~ draftstops. Required *fireblocking* and ~~draftstopping~~ draftstops in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

SECTION 708
SPRAY FIRE-RESISTIVE MATERIALS AND INTUMESCENT FIRE-RESISTIVE COATINGS

708.1 Maintaining Protection. Where required when the building was originally permitted and constructed, spray fire-resistant materials and intumescent fire-resistant materials shall be visually inspected to verify that the materials do not exhibit exposure to the substrate.

CHAPTER 8 INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

803.11.1 Foam plastics combustibility characteristics. Foam plastics ~~materials~~ shall be allowed to be used as interior wall and ceiling finish only where in accordance with ~~on the basis of fire tests that substantiate their combustibility characteristics for the use intended under actual fire conditions, as indicated in~~ Section 2603.9 of the *International Building Code*. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

805.2 Group I-2 and ~~Group B~~ ambulatory care facilities. The requirements in Sections 805.2.1 through 805.2.2 shall apply to Group I-2 occupancies and ~~Group B~~ ambulatory care facilities.

806.1.4 Fire retardant treatments for natural cut trees. Where fire retardant treatments applied to natural cut trees the fire retardant treatment shall be tested by an *approved* agency and shall comply with both Test Method 1 and Test Method 2 of ASTM E3082.

808.1 Waste~~baskets~~ and ~~-~~linen containers in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities. Waste~~baskets~~ and linen containers ~~and other waste containers, including their lids,~~ located in Group I-1, I-2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall comply with Section 304.3.6 ~~be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 509.1 of the International Building Code.~~

> ~~**Exception:** Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.~~

~~**808.1.1 Capacity density.** The average capacity density of containers located in an individual room or space, other than waste and linen collection rooms, shall not be greater than 0.5 gal/ft^2 (20.4 L/m^2).~~

808.1.2 Recycling clean waste containers. Recycling clean waste containers, including their lids, shall not exceed an individual capacity of 96 gallons (363 L).

808.2 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories. Waste containers, including their lids, located in Group R-2 college and university dormitories, and with a capacity of 20 gallons (75.7 L) or more, shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room constructed in accordance with Table 509.1 of the International Building Code.

808.4 Play structures added to existing buildings. Where play structures that exceed 10 feet (3048 mm) in height or 150 square feet (14 m^2) in area are added inside an existing building they shall comply with Section 424 of the International Building Code.

CHAPTER 9 FIRE PROTECTION AND LIFE SAFETY SYSTEMS

901.1 Scope. The provisions of this chapter shall specify where *fire protection* and *life safety systems* are required and shall apply to the design, installation, inspection, operation, testing and maintenance of all *fire protection* and *life safety systems*.

901.2 Construction documents. The *fire code official* shall have the authority to require construction documents and calculations for all *fire protection* and *life safety systems* and to require permits be issued for the installation, rehabilitation or modification of any *fire protection* and *life safety system*. Construction documents for *fire protection* and *life safety systems* shall be submitted for review and approval prior to system installation.

901.2.1 Statement of compliance. Before requesting final approval of the installation, where required by the *fire code official*, the installing contractor shall furnish a written statement to the *fire code official* that the subject fire *protection* or *life safety system* has been installed in accordance with approved plans and has been tested in accordance with the manufacturer's specifications and the appropriate installation standard. Any deviations from the design standards shall be noted and copies of the approvals for such deviations shall be attached to the written statement.

[NY] 901.3 Permits. Permits shall be required as set forth in Sections 105.26 and 105.67.

901.4 Installation. Fire Protection and Life Safety Systems. Fire protection systems shall be maintained in accordance with the original installation standards for that system. Required systems shall be extended, altered or augmented as necessary to maintain and continue protection where the building is altered, remodeled or added to. Alterations to fire protection systems shall be done in accordance with applicable standards. *Fire protection* and *life safety systems* shall be installed, repaired, operated, and maintained in accordance with this code and the *International Building Code*.

901.4.1 Required fire protection and life safety systems. *Fire protection* and *life safety systems* required by this code or the *International Building Code* shall be installed, repaired, operated, tested and maintained in accordance with this code. A *fire protection system* or *life safety system* for which a design option, exception or reduction to the provisions of this code or the International Building Code has been granted shall be considered to be a required system.

901.4.2 Nonrequired fire protection and life safety systems. A fire protection system *Fire protection* and *life safety systems* or portion thereof not required by this code or the International Building Code shall be allowed to be furnished for partial or complete protection provided that such installed system meets the applicable requirements of this code and the International Building Code.

901.4.3 Alterations in Buildings and Structures. For any alteration within a building or structure, the *fire protection* and *life safety systems* shall be extended, altered, or augmented to maintain and continue protection within the building or structure. Persons shall not remove or modify any *fire protection* or *life safety system* installed or maintained under the provisions of this code or the *International Building Code* without approval by the *fire code official*.

901.4.4 901.4.5 Additional fire protection systems. In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the fire code official determines that access for fire apparatus is unduly difficult, the fire code official shall have the authority to require additional safeguards. Such

~~safeguards include, but shall not be limited to, the following: automatic fire detection systems, fire alarm systems, automatic fire extinguishing systems, standpipe systems, or portable or fixed extinguishers. Fire protection equipment~~ safeguards and *fire protection systems. Fire protection* and *life safety systems* required under this section shall be installed in accordance with this code and the applicable referenced standards.

901.5 Administration of ~~I~~installation acceptance testing. ~~Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other fire~~ *Fire protection* and *life safety systems* and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the *fire code official*. The *fire code official* shall be notified before any required acceptance testing.

901.5.1 Occupancy. It shall be unlawful to occupy any portion of a building or structure until the required *fire* ~~detection, alarm and suppression~~ *protection* and *life safety systems* have been tested and approved.

901.6 Inspection, testing and maintenance. *Fire* ~~detection and alarm systems, emergency alarm systems, gas detection systems, fire extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents~~ *protection* and *life safety systems* shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection* and *life safety systems* and equipment shall be inspected, tested and maintained or removed in accordance with Section 901.8.

TABLE 901.6.1 FIRE PROTECTION SYSTEM INSPECTION, TESTING AND MAINTENANCE STANDARDS

NOTE: Only the modified portions of the table are shown, unchanged portions are omitted.

SYSTEM	STANDARD
Fire dampers	NFPA 80
Smoke dampers	NFPA 105

901.6.3 Records. Records of all system inspections, tests and maintenance ~~required by the referenced standards~~ shall be maintained in accordance with Section 110.3.

901.7 Systems out of service. Where a required *fire protection system* is out of service, the fire department and the *fire code official* shall be notified immediately and, where required by the *fire code official*, the building shall be either evacuated or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the *fire protection system* has been returned to service.

Where utilized, fire watches shall be provided with not less than one *approved* means for notification of the fire department and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

> **Exception:** Facilities with an *approved* notification and impairment management program. The notification and impairment program for water-based *fire protection systems* shall comply with NFPA 25.

901.8 Removal of or tampering with equipment. It shall be unlawful for any person to remove, tamper with or otherwise disturb any *fire* ~~hydrant, fire detection and alarm system, fire suppression system or other fire appliance~~ *protection* or *life safety system* required by this code except for the purposes of extinguishing fire, training, recharging or making necessary repairs or where approved by the *fire code official*.

SECTION 902

DEFINITIONS

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

ALARM NOTIFICATION APPLIANCE .

ALARM SIGNAL .

…

LIFE SAFETY SYSTEMS .

…

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

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 not required to have an *automatic sprinkler system* by Section 1207 for energy storage systems and standby engines, provided that 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 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.

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

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

903.2.2 Group B. An automatic sprinkler system shall be provided for Group B occupancies as required in Sections 903.2.2.1 and 903.2.2.2.

903.2.2.1 ~~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.
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 as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest level of exit discharge, the *level of exit discharge*, and all floors below the *level of exit discharge*.

> **Exception:** Floors classified as an open parking garage are not required to be sprinklered.

903.2.2.2 Laboratories; research and development or testing. An *automatic sprinkler system* shall be installed throughout the fire areas utilized for the research and development or testing of lithium-ion or lithium metal batteries.

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. 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).

~~4.A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m2)~~

4. A Group F-1 occupancy used to manufacture lithium-ion or lithium metal batteries.
5. A Group F-1 occupancy used to manufacture vehicles, energy storage systems or equipment containing lithium-ion or lithium metal batteries where the batteries are installed as part of the manufacturing process.

903.2.4.2 Group F-1 Distilled Spirits. An *automatic sprinkler system* shall be provided throughout a Group F-1 *fire area* used for the manufacture of distilled spirits.

903.2.4.3 Group F-1 upholstered furniture or mattresses. An *automatic sprinkler system* shall be provided throughout a Group F-1 *fire area* that exceeds 2,500 square feet (232 m2) used for the manufacture of upholstered furniture or mattresses.

903.2.5.2 Group H-5 occupancies. An *automatic sprinkler system* shall be installed throughout buildings containing Group H-5 occupancies. The design of the *automatic sprinkler system* shall be not less than that required under the *International Building Code* for the occupancy hazard classifications in accordance with Table 903.2.5.2.

Where the design area of the *automatic sprinkler system* consists of a *corridor* protected by one row of sprinklers, the maximum number of sprinklers required to be calculated is 13.

TABLE 903.2.5.2 GROUP H-5 AUTOMATIC SPRINKLER SYSTEM 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

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).~~

903.2.7.2 Group M upholstered furniture or mattresses. An *automatic sprinkler system* shall be provided throughout a Group M *fire area* where the area used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m^2).

903.2.7.3 Lithium-ion or lithium metal battery storage. An *automatic sprinkler system* shall be provided in a room or space within a Group M occupancy where required for the storage of lithium-ion or lithium metal batteries by Section 320 or Chapter 32.

~~**903.2.8.3 Group R-4, Condition 2.** An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4, Condition 2 occupancies.~~

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 motor vehicles 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).~~

5. A Group S-1 *fire area* used for the storage of lithium-ion or lithium metal powered vehicles where the *fire area* exceeds 500 square feet (46.4 m^2)

903.2.9.1 Repair garages. An *automatic sprinkler system* shall be provided throughout all buildings used as repair garages in accordance with Section 406.8 of the *International Building Code*, 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 not 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 motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 *fire area* used for the repair of vehicles powered by lithium-ion or lithium metal batteries that exceeds 500 square feet (46.4 m^2).

903.2.9.2 Group S-1 Distilled spirits or wine. An *automatic sprinkler system* shall be provided throughout a Group S-1 *fire area* used for the bulk storage of distilled spirits or wine.

903.2.9.4 Group S-1 upholstered furniture and mattresses. An *automatic sprinkler system* shall be provided throughout a Group S-1 *fire area* where the area used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m^2).

Exception: Self-service storage facilities no greater than one story above *grade plane* where all storage spaces can be accessed directly from the exterior.

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 406.6 of the International Building Code where either~~ where any of the following conditions exist~~s~~:

1.Where the *fire area* of the enclosed parking garage, in accordance with Section 406.6 of the International Building Code, exceeds 12,000 square feet (1115 m^2).

2.Where the enclosed parking garage, in accordance with Section 406.6 of the International Building Code, is located beneath other groups.

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

3.Where the *fire area* of the open parking garage, in accordance with Section 406.5 of the International Building Code, exceeds 48,000 square feet (4460 m^2).

903.2.10.2 Mechanical-access enclosed parking garages. An *approved automatic sprinkler system* shall be provided throughout buildings used for the storage of motor vehicles in a mechanical-access enclosed parking garage. The portion of the building that contains the mechanical-access enclosed parking garage shall be protected with specially engineered *automatic sprinkler system*.

903.2.11.3 Buildings 55 feet or more in height. An *automatic sprinkler system* shall be installed throughout buildings that have one or more stories with an *occupant load* of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

Exception: ~~Exceptions:~~

~~1.Open parking structures.~~

~~2.~~Occupancies in Group F-2.

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

TABLE 903.2.11.6

ADDITIONAL REQUIRED FIRE ~~SUPPRESSION~~ PROTECTION SYSTEMS

SECTION	SUBJECT
321.2	Lithium-ion and lithium metal battery storage
903.2.10.2	Mechanical-access enclosed parking garages
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement area ~~buildings~~
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1030.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.5	Existing Group I-2, Condition 2 occupancies
1103.5.5	Pyroxylin plastics
Table 1206.9, Table 1206.10, Table 1207.7, Table 1207.8	Stationary and mobile energy storage systems
2108.2	Dry cleaning plants

2108.3	Dry cleaning machines
2309.3.1.5.2	Hydrogen motor fuel-dispensing area canopies
2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3210.1.1	Record storage over 12 feet
3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses

5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m .

903.3.1 Standards. *Automatic 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.

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 a room merely because it is damp, of *fire-resistance-rated* construction or contains electrical equipment.

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

~~2.~~ 1. A room or space where sprinklers ~~are considered undesirable~~ constitute a serious life or fire hazard because of the nature of the contents, where *approved* by the *fire code official*.

~~3.~~ 2. 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.~~ 3. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.

~~5.~~ 4. Fire service access elevator machine rooms and machinery spaces.

~~6.~~ 5. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008 of the International Building Code.

903.3.1.1.3 Lithium-Ion or lithium metal batteries. Where *automatic sprinkler systems* are required by this code for areas containing lithium-ion or lithium metal batteries, the design of the system shall be based upon a series of fire tests conducted or witnessed and reported by an approved testing laboratory involving test scenarios that address the range of variables associated with the intended arrangement of the hazards to be protected.

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies ~~up to and including four stories in height in buildings not exceeding 60 feet (18 288 mm) in height above grade plane~~ shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above *grade plane*.

2. For other than Group R-2 occupancies, the floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   For Group R-2 occupancies, the roof assembly is less than 45 feet (13716 mm) above the lowest level of fire department vehicle access. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the *exterior wall*, or the top of the highest parapet, whichever yields the greatest distance.

3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from ~~the horizontal assembly creating separate buildings.~~*grade plane*.

903.3.1.2.2 ~~Open-ended corridors.~~ Corridors and balconies in the means of egress. Sprinkler protection shall be provided in *corridors* and for balconies in the *means of egress* where any of the following conditions apply:

1.*Corridors* with combustible floor or walls.

2.*Corridors* with an interior change of direction exceeding 45 degrees (0.79 rad).

3.*Corridors* that are less than 50 percent open to the outside atmosphere at the ends.

4.Open-ended *corridors* and associated exterior *stairways* and *ramps* as specified in Section 1027.6, Exception 3.

5.Egress balconies not complying with Sections 1021.2 and 1021.3.

903.3.1.2.3 Attics. Attic protection shall be provided as follows:

1.Attics that are used or intended for living purposes or storage shall be protected by an *automatic sprinkler system*.

2.Where fuel-fired equipment is installed in an unsprinklered attic, not fewer than one quick-response intermediate temperature sprinkler shall be installed above the equipment.

3.Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or 510.4 of the International Building Code, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of ~~required~~ fire department vehicle access needed to meet the provisions in Section 503:

3.1.Provide *automatic sprinkler system* protection.

3.2.Construct the attic using noncombustible materials.

3.3.Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.

3.4.Fill the attic with noncombustible insulation. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4.Group R-4, Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:

4.1.Provide *automatic sprinkler system* protection.

4.2.Provide a heat detection system throughout the attic that is arranged to activate the building fire alarm system.

4.3.Construct the attic using noncombustible materials.

4.4.Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the International Building Code.

4.5.Fill the attic with noncombustible insulation.

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 all of 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 the *International Building Code*.

2.Throughout all spaces within a *smoke compartment* containing gas fireplace appliances and decorative gas appliances in Group I-2 in accordance with the *International Building Code*.

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

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

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

903.3.9 ~~903.4.3~~ High-rise building floor ~~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.

903.4 Sprinkler system supervision and alarms. *Automatic sprinkler system* supervision and alarms shall comply with Sections 903.4.1 through 903.4.3.

903.4.1 Electronic supervision. 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 sprinkler systems in accordance with Section 903.3.8, provided that backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position unless supplying an occupancy required to be equipped with a fire alarm system, in which case the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.
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.
8. Underground key or hub gate valves in roadway boxes.

~~903.4.1~~ 903.4.2 **Monitoring.** Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an *approved* supervising station or, where *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.~~

~~903.4.2~~ 903.4.3 **Alarms.** An *approved* audible and visual sprinkler waterflow alarm device, located on the exterior of the building in an *approved* location, shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow 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 water flow switch is required by Section 903.4.1 to be electrically supervised, such sprinkler waterflow alarm devices shall be powered by a fire alarm control unit or, where provided, a fire alarm system. Where a *fire alarm system* is provided ~~installed~~, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

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

903.5 Inspection, ~~T~~ testing and maintenance. *Automatic ~~S~~sprinkler systems* shall be inspected, tested and maintained in accordance with Section 901.

904.2.2 Commercial hood and duct systems. Each required commercial kitchen exhaust hood and duct system required by Sections 606 and 4106 to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.

904.12 Hybrid Systems. Hybrid fire-extinguishing systems shall be installed, maintained, periodically inspected, and tested in accordance with NFPA 770. Records of inspection and testing shall be maintained.

~~904.14~~904.13 **Aerosol fire-extinguishing systems.** Aerosol fire-extinguishing systems shall be installed, maintained, periodically inspected~~,~~ and tested ~~and maintained~~ in accordance with ~~Sections 901 and 904.4,~~ NFPA 2010~~,~~ and ~~in accordance with~~ their listing.

Such devices and appurtenances shall be *listed* and installed in compliance with manufacturer's instructions.

~~904.14.1~~904.13.1 **Maintenance.** Not less than semiannually, an inspection shall be conducted by a trained person to assess whether the system is in working order. Not less than annually, a certified fire suppression contractor having knowledge of and training in the installation, operation and maintenance of the specific fire-extinguishing system shall inspect, test, service and maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals. Records of inspections and testing shall be maintained.

~~904.12~~ 904.14 **Commercial cooking systems. (Note: The content of this section was not revised and is omitted.)**

~~904.12.1~~ 904.14.1 **Manual system operation.** A manual actuation device shall be located at or near a means of egress from the cooking area not less than 10 feet (3048 mm) and not more than 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor 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**~~ **Exceptions:**

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

2. Where locating the manual actuation device between 10 feet (3048 mm) to 20 feet (6096 mm) from the cooking area is not feasible, the *fire code official* is permitted to accept a location at or near a *means of egress* from the cooking area, where the manual actuation device is unobstructed and in view from the *means of egress*.

3. Mobile food preparation vehicles in accordance with Section 4106 ~~319~~.

~~904.13~~ 904.15 Domestic cooking ~~systems~~ facilities. Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.1~~3~~5.1:

1.In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section ~~420.8~~ 420.9 of the International Building Code.

2.In Group I-2 ~~, Condition 1~~ occupancies where domestic cooking facilities are installed in accordance with Section ~~407.2.6~~407.2.7 of the International Building Code.

3.In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.1~~0~~1 of the International Building Code.

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*.

Exceptions:

1. Standpipe systems are not required in Group R-2 *townhouses*.

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

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where any of the following conditions exist:

1. Four or more stories are above or below *grade plane*.
2. The floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access.
3. 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 standpipes are allowed in Group B and E occupancies.
3. 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.~~ parking garages.
4. 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.
5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
6. Class I standpipes are allowed in buildings where occupant-use hose lines will not be utilized by trained personnel or the fire department.
7. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   7.1. Recessed loading docks for four vehicles or less.
   7.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

~~**905.3.4 Stages.** Stages greater than 1,000 square feet (93 m^2) in area 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.~~

905.3.~~8~~7 Vegetative roofs ~~Rooftop gardens~~ and landscaped roofs. Buildings or structures that have ~~rooftop garden or~~ *landscaped roofs* or *vegetative 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* or *vegetative roof* is located.

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 *interior exit stairway* or *exterior exit stairway*, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open *breezeway* between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

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 an *interior exit stairway* or *exterior exit stairway* hose connection 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 an *interior exit stairway* or *exterior exit stairway* hose connection 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 4 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 an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.

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.

905.5.1 Groups A-1 and A-2. In Group A-1 and A-2 occupancies with *occupant loads* of more than 1,000, hose connections shall be located ~~on each side of any stage,~~ on each side of the rear of the auditorium, and on each side of the balcony ~~and on each tier of dressing rooms~~.

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 903.4.1. Where a *fire alarm system* is provided, a signal shall 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.

905.11 Locking standpipe outlet caps. The *fire code official* is authorized to require locking caps on the outlets on ~~dry~~ standpipes where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, and S occupancies and mobile food preparation vehicles in accordance with Section 4106~~319~~.

Exceptions:

1. 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. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.

3. In storage areas of Group S occupancies where forklift, powered industrial truck or powered cart operators are the primary occupants, fixed extinguishers, as specified in NFPA 10, shall not be required where in accordance with all of the following:

3.1. Use of vehicle-mounted extinguishers shall be approved by the *fire code official*.

3.2. Each vehicle shall be equipped with a 10-pound, 40A:80B:C extinguisher affixed to the vehicle using a mounting bracket approved by the extinguisher manufacturer or the fire code official for vehicular use.

3.3. Not less than two spare extinguishers of equal or greater rating shall be available on-site to replace a discharged extinguisher.

3.4. Vehicle operators shall be trained in the proper operation, use and inspection of extinguishers.

3.5. Inspections of vehicle-mounted extinguishers shall be performed daily.

2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.

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 Section 3316.1.

5. Where required by the sections indicated in Table 906.1.

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

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

TABLE 906.1

ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS

SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
1204.10	Portable generators
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus

2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3107.9	Tents and membrane structures
3206.10	High-piled storage
3316.1	Buildings under construction or demolition
3318.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units

5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5707.5.4	On-demand mobile fueling
5906.5.7	Flammable solids
6108.2	LP-gas

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, or where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the International Building Code 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.

Exceptions:

1. 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 water flow.
2. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for Group A-5 outdoor bleacher-type seating having an occupant load of greater than or equal to 300 and less than 15,000 occupants provided all of the following are met:
   - 2.1 A public address system with standby power is provided.
   - 2.2 Enclosed spaces attached to or within 5 ft (1.5 m) of the outdoor bleacher-type seating comprise, in the aggregate, a maximum of 10 percent of the overall area of the outdoor bleacher-type seating or 1000 square feet (92.9 m^2), whichever is less.
   - 2.3 Enclosed accessory spaces under or attached to the outdoor bleacher-type seating shall be separated from the bleacher-type seating in accordance with Section 1030.1.1.1 of this code.
   - 2.4 All means of egress from the bleacher-type seating are open to the outside.
3. Manual fire alarm boxes and the associated occupant notification system or emergency voice/alarm communication system are not required for temporary Group A-5 outdoor bleacher-type seating provided all of the following are met:
   - 3.1 There are no enclosed spaces under or attached to the outdoor bleacher-type seating;
   - 3.2 The bleacher-type seating is erected for a period of less than 180 days; and
   - 3.3 Evacuation of the bleacher-type seating is included in an *approved* fire safety plan.

907.2.2 Group B. A manual fire alarm system, which activates the occupant notification system in accordance with Section 907.5, 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 water flow.

907.2.2.2 Laboratories; research and development or testing. A *fire alarm system* activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire *fire area* utilized for the research and development or testing of lithium-ion or lithium metal batteries.

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. Where 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 50 or less.

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

3.Manual fire alarm boxes ~~are~~shall *not* be required in Group E occupancies where all of the following apply:

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

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

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

3.4. Manual activation is provided from a normally occupied location.

4.Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:

4.1.The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.

4.2.The emergency voice/alarm communication system will activate on sprinkler water flow.

4.3.Manual activation is provided from a normally occupied location.

907.2.4.1 Manufacturing involving lithium-ion or lithium metal batteries. A *fire alarm system* activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire *fire area* where lithium-ion or lithium metal batteries are manufactured; and where the manufacturer of vehicles, energy storage systems or equipment containing lithium-ion or lithium metal batteries where the batteries are installed as part of the manufacturing process.

907.2.7 Group M. Fire alarm systems shall be required in Group M occupancies in accordance with Sections 907.2.7.1 and 907.2.7.2:

907.2.7.1 ~~**907.2.7 Group M**~~ **Occupant load.** 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 of the International Building Code.

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 water flow.

907.2.7.1.1 ~~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.

907.2.7.2 Storage of lithium-ion or lithium metal batteries. A *fire alarm system* activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed in a room or space within a Group M occupancy where required for the storage of lithium ion or lithium metal batteries by Section 320.

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 *dwelling units*, *sleeping units*, and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour *fire partitions* and each individual *dwelling unit* and *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 where 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 water flow.
   2.3. Not fewer than one manual fire alarm box is installed at an *approved* location.

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 *dwelling units* or *sleeping units*.

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

907.2.10 Group S. A fire alarm system shall be in a Group S occupancy as required by Sections 907.2.10.1 and 907.2.10.2.

907.2.10.1 Public- and self-storage occupancies. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S public- and self-storage occupancies three stories or greater in height for interior *corridors* and interior common areas. Visible notification appliances are not required within storage units.

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 water flow.

907.2.10.2 Storage of lithium-ion or lithium metal batteries. A fire alarm system activated by an air sampling-type smoke detection system or a radiant energy-sensing detection system shall be installed throughout the entire fire area where required for the storage of lithium-ion batteries or lithium metal batteries in accordance with Section 320.

907.2.~~10~~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 907.2.11.7, ~~and~~ NFPA 72 and the manufacturer's instructions.

907.2.~~10~~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 *dwelling units* or *sleeping unit*.

3. In each story within the *dwelling units* or *sleeping unit*, including *basements*. For *dwelling units* or *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.

907.2.~~10~~11.3 Installation near cooking appliances. Smoke alarms shall ~~not~~ be installed not less than 10 ft (3.0 m) horizontally from a permanently installed cooking appliance. ~~in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 907.2.11.1 or 907.2.11.2:~~

Exception: Smoke alarms shall be permitted to be installed ~~between~~ not less than 6 ft. (1.8 m) ~~and 10 ft. (3.0 m)~~ horizontally from a permanently installed cooking appliance where necessary to comply with Section 907.2.11.1 or 907.2.11.2.

~~1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~

~~2. Ionization smoke alarms with an alarm silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~

~~3. Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.~~

[NY]907.2.~~10~~11.8 Portable smoke alarms in Group R-1 occupancies and Group R-3 lodging houses.

In addition to, but not in limitation of, any other requirement of this code, portable smoke alarms of both audible and visual design shall be provided in all buildings of Group R-1 occupancies and Group R-3 lodging houses. The number of smoke alarms available shall be 3 percent of the number of sleeping units with a minimum of one operational smoke alarm per building. Proprietors shall conspicuously post a sign, with letters at least 3 inches (76 mm) in height, at the main desk or other similar station advising of the availability of such smoke alarms. Such smoke alarms shall be in conformity with NFPA 72.

Exception: Portable smoke alarms shall not be required where any of the following applies:

1. Where audible/visual smoke alarms are hard wired.
2. Where audible/visual smoke alarms are incorporated into a fire alarm system such that visual notification is activated by the system.

907.2.12~~1~~ Special amusement areas ~~buildings~~. Fire detection and alarm systems shall be provided in *special amusement areas* in accordance with Section 914.7. ~~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.~~

~~**907.2.11.1 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.~~

~~**907.2.11.2 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 do all of the following:~~

~~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.~~

~~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 that is distinctive from other sounds used during normal operation.~~

~~**907.2.11.3 Emergency voice/alarm communication system.** An emergency voice/alarm communication system, which is 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.~~

907.2.1~~2~~3.2 Fire department communication system. Where a wired communication system is *approved* in lieu of an in-building, two-way emergency responder ~~radio~~ communication coverage system in accordance with Section 510, 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 508, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside *interior exit stairways*. The fire department communication device shall be provided at each floor level within the *interior exit stairway*.

907.2.1~~5~~6 Aerosol storage uses. Aerosol product rooms and general-purpose warehouses containing aerosol products, aerosol cooking spray products or plastic aerosol 3 products shall be provided with an approved manual fire alarm system where required by this code.

~~[NY]~~907.2.2~~2~~3 ~~Battery rooms.~~ Energy storage systems. An *automatic smoke detection system* or radiant-energy detection system shall be installed in rooms, areas and walk-in units containing ~~stationary~~ energy storage ~~battery~~ systems as required in Section ~~1206.2.~~1207.5.4

~~[NY]907.2.23 Capacitor energy storage systems.~~ ~~An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 1206.3.~~

907.4 Initiating devices. Where ~~manual or automatic alarm initiation is required as part of a fire alarm system, the initiating~~ a *fire alarm system* is required by another section of this code, occupant notification in accordance with Section 907.5 shall be initiated by one or more of the following. Initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

1. Manual fire alarm boxes.
2. Automatic fire detectors.
3. *Automatic sprinkler system* waterflow devices.
4. *Automatic fire-extinguishing* systems.

~~[NY]~~907.4.2.4 Signs. Where fire alarm systems are not monitored by an *approved* supervising station in accordance with Section 907.6.6, 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.

907.5 Occupant ~~notification systems~~ notification. ~~A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation,~~ Occupant notification by fire alarms shall be in accordance with Sections 907.5.1 through 907.5.2.3.3. Occupant notification by smoke alarms in Groups R-1 and R-2 occupancies shall comply with Section 907.5.2.1.3.2. ~~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.~~

907.5.1 Alarm activation and annunciation. Upon activation, fire alarm systems shall initiate occupant notification and shall annunciate at the fire alarm control unit, or where allowed elsewhere in Section 907, at a constantly attended location.

~~907.5.1~~907.5.1.1 Presignal feature. A presignal feature shall ~~not~~ only be provided where ~~approved by the fire code official. Where a presignal feature is provided, a signal~~ *approved*. The presignal shall be annunciated at an *approved* ~~at a~~ constantly attended location ~~approved by the fire code official, so that occupant notification can be activated in~~ having the capability to activate the occupant notification system in the event of fire or other emergency.

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. Audible alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
2. A visible alarm notification appliance installed in a nurses' control station or other continuously attended staff location in a Group I-2, Condition 2 suite shall be an acceptable alternative to the installation of audible alarm notification appliances throughout the suite or unit in Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
3. Where provided, audible notification appliances located in each enclosed occupant evacuation elevator lobby in accordance with Section 3008.9.1 of the International Building Code shall be connected to a separate notification zone for manual paging only.

907.5.2.1.2 Maximum sound pressure. The ~~maximum~~ total sound pressure level ~~for audible alarm~~ produced by combining the ambient sound pressure level with all audible notification appliances operating shall ~~be~~ not exceed 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than ~~95~~ 105 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

907.5.2.1.3 Audible alarm signal frequency in Groups R-1, R-2 , and I-1 sleeping rooms. Audible signal frequency in Groups R-1, R-2, and I-1 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.2.1.3.2.

907.5.2.1.3.1 Fire alarm system audible signal. In sleeping rooms of Groups R-1, R-2, and I-1 occupancies, the audible alarm signal activated by a fire alarm system shall be a 520 Hz low-frequency signal complying NFPA 72.

907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Groups R-1, R-2, and I-1 occupancies that are required by Sections 907.2.8 or 907.2.9 to have a fire alarm system, the audible alarm signal activated by single- or multiple-station smoke alarms in the dwelling unit or sleeping unit shall be a 520 Hz signal complying NFPA 72.

Where a sleeping room smoke alarm is unable to produce a 520 Hz signal, the 520 Hz alarm signal shall be provided by a listed notification appliance or a smoke detector with an integral 520 Hz sounder.

907.5.2.2.5 Standby ~~Emergency~~ power. Emergency voice/alarm communications systems shall be provided with ~~emergency~~ standby power in accordance with Section 1203~~. The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72~~.

907.5.2.3 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.3.

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.
4. Visual alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
5. A visible alarm notification appliance installed in a nurses' control station or other continuously attended staff location in a Group I-2, Condition 2 suite shall be an acceptable alternative to the installation of visible alarm notification appliances throughout the suite or unit in Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.

TABLE 907.5.2.3.2
VISIBLE ALARMS

AGGREGATE NUMBER OF DWELLING UNITS AND SLEEPING 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

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a *fire alarm system*, each *story* that contains *dwelling units* and *sleeping units* shall be provided with ~~the future~~ the capability to support future visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. Such capability shall accommodate wired or wireless equipment. ~~The future capability shall include one of the following:~~

~~1.The interconnection of the building fire alarm system with the unit smoke alarms.~~

~~2.The replacement of audible appliances with combination audible/visible appliances.~~

~~3.The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.~~

907.5.2.3.3.1 Wired equipment. Where wired equipment is used to comply with the future capability required by Section 907.5.2.3.3, the system shall include one of the following capabilities:

1. The replacement of audible appliances with combination audible/visible appliances or additional visible notification appliances.
2. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.
3. For wired equipment, the fire alarm power supply and circuits shall have not less than 5% excess capacity to accommodate future addition of visible alarm notification appliances, and a single access point to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story. The fire alarm system shop drawings required by Section 907.1.2 of the Code shall include the power supply and circuit documentation to accommodate future addition of visible notification appliances.

907.6.4.2 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~~ protection systems.

907.6.6.1 ~~Automatic telephone dialing devices.~~ Transmission of alarm signals. ~~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.~~ Transmission of alarm signals to a supervising station shall be in accordance with NFPA 72.

907.6.6.2 MIY Monitoring. Direct transmission of alarms associated with Monitor it Yourself (MIY) transmitters to a public safety answering point (PSAP) shall not be permitted unless *approved* by the *fire code official*.

~~**907.8.4 Sensitivity test method.** To verify that each smoke detector is within its listed and marked sensitivity range, it shall be tested using one of the following methods:~~

~~1.A calibrated test method.~~

~~2.The manufacturer's calibrated sensitivity test instrument.~~

~~3.Listed control equipment arranged for the purpose.~~

~~4.A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector's sensitivity is outside its acceptable sensitivity range.~~

~~5.Another calibrated sensitivity test method acceptable to the fire code official.~~

~~Detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced.~~

~~**Exceptions:**~~

~~1.Detectors listed as field adjustable shall be permitted to be either adjusted within the listed and marked sensitivity range and cleaned and recalibrated or they shall be replaced.~~

~~2.This requirement shall not apply to single-station smoke alarms.~~

~~**907.8.4.1 Sensitivity testing device.** Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector~~

~~**907.8.5**~~907.8.4 **Inspection, testing and maintenance.** The building *owner* shall be responsible to maintain the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for inspection, testing and maintenance of such systems. Records of inspection, testing and maintenance shall be maintained.

907.10 Smoke alarm maintenance. Smoke alarms shall be tested and maintained in accordance with the manufacturer's instructions and this code.

~~Smoke alarms shall be replaced: when they fail to respond to operability tests or when they exceed 10 years from the date of manufacture unless an earlier replacement is specified in the manufacturer's published instructions~~.

907.10.1 Smoke alarm replacement. Smoke alarms shall be replaced where any of the following apply:

1. The smoke alarm fails to respond to operability tests.
2. Where the smoke alarm exceeds 10 years from the date of manufacture marked on the unit, unless an earlier replacement is specified in the manufacturer's instructions.
3. The smoke alarm end-of-life signal is sounded.
4. The smoke alarm date of manufacturer cannot be determined.

Where the replacement of smoke alarms is required by this section ~~in accordance with Section 907.10~~, smoke alarms shall not be required to include the 520hz signal unless the smoke alarms to be replaced includes that signal.

908.3 Fire alarm system interface. Where an emergency alarm system is interfaced with a building's fire alarm system, the signal produced at the fire alarm control unit shall be a supervisory signal.

909.6.1 Minimum pressure difference. The pressure difference across a smoke barrier used to separate smoke zones shall be not less than 0.05-inch water gage (0.0124 kPa) in ~~fully sprinklered~~ buildings equipped throughout with automatic sprinkler systems.

In buildings permitted to be not equipped throughout with automatic sprinkler systems, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.

909.6.3 Pressurized stairways and elevator hoistways. Where *stairways* or elevator hoistways are pressurized, such pressurization systems shall comply with Section 909 as smoke control systems, in addition to the requirements of ~~Section 909.21 of this code and Section 909.20 of the International Building Code.~~ Sections 909.20 and 909.21.

909.12.1 Verification. Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override and the presence of power downstream of all disconnects. A preprogrammed weekly test sequence shall report abnormal conditions audibly, visually and by printed report. The preprogrammed weekly test shall operate all devices, equipment, and components used for smoke control.

Exception: Where verification of individual components tested through the preprogrammed weekly testing sequence will interfere with, and produce unwanted effects to, normal building operation, such individual

components are permitted to be bypassed from the preprogrammed weekly testing, where approved by the fire code official and in accordance with both of the following:

1.Where the operation of components is bypassed from the preprogrammed weekly test, presence of power downstream of all disconnects shall be verified weekly by a listed control unit.

2.Testing of all components bypassed from the preprogrammed weekly test shall be in accordance with Section ~~909.20.6.~~909.22.6.

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. Upon receipt of an alarm condition at the fire alarm control panel, fans, dampers and automatic doors shall have achieved their proper operating state and final status shall be indicated at the smoke control panel within 90 seconds. 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.

909.18.3 Dampers. Dampers shall be tested for function in their installed condition in accordance with NFPA 80 and NFPA 105.

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 Section ~~909.20.1~~ 909.22.1 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.

[BF] 909.20 Smokeproof enclosures. Where required by Section 1023.12, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an interior exit stairway or ramp that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony meeting the requirements of this section. Where access to the roof is required, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

[BF] 909.20.1 Access. Access to the stairway or ramp shall be by way of a vestibule or an open exterior balcony. The minimum dimension of the vestibule shall be not less than the required clear 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 into the stairway, measured in a straight line between the centerline of the doorways into the vestibule and stairway.

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

[BF] 909.20.2.1 Door closers. Doors in a smokeproof enclosure shall be self-closing or automatic closing by actuation of a smoke detector in accordance with Section 716.2.6.3 of the International Building Code 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.

[BF] 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.

[BF] 909.20.3.1 Balcony doors. Where access to the stairway or ramp 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 of the International Building Code.

[BF] 909.20.3.2 Vestibule doors. Where access to the stairway or ramp is by way of a vestibule, the door assembly into the vestibule shall be a fire door assembly complying with Section 716 of the International Building Code. The door assembly from the vestibule to the stairway shall have not less than a 20-minute fire protection rating complying with Section 716 of the International Building Code.

[BF] 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 not less than 20 feet (6096 mm) in width.

[BF] 909.20.4 Stairway and ramp 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 each interior exit stairway or ramp is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all interior exit stairway and ramp doors closed under maximum anticipated conditions of stack effect and wind effect.

[BF] 909.20.5 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Section 909.20.4 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 stairway and ramp 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.

[BF] 909.20.5.1 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 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, 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 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, 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 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

Exceptions: Control wiring and power wiring located outside of a 2-hour fire barrier construction shall be protected using any one of the following methods:

1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 2 hours.
2. Where encased with not less than 2 inches (51 mm) of concrete.
3. Electrical circuit protective systems shall have a fire-resistance rating of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.

[BF] 909.20.5.2 Standby power. Mechanical vestibule and stairway and ramp shaft ventilation systems and automatic fire detection systems shall be provided with standby power in accordance with Section 1203.

[BF] 909.20.5.3 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.

[BF] 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. The design shall consider the interaction effects of the operation of multiple smoke control systems for all design scenarios in accordance with Section 909.4.7. All components or systems associated with the means of mitigating adverse interaction shall comply with the applicable subsections of Section 909.

~~909.20~~909.22 **Maintenance.** Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The system shall be maintained in accordance with the manufacturer's instructions and Sections ~~909.20.1~~ 909.22.1 through ~~909.20.6.~~909.22.6.

~~909.20.1~~909.22.1 **Schedule.** A routine maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests. A written schedule for routine maintenance and operational testing shall be established.

~~909.20.2~~909.22.2 **Records.** Records of smoke control system testing and maintenance shall be maintained. The record shall include the date of the maintenance, identification of the servicing personnel and notification of any unsatisfactory condition and the corrective action taken, including parts replaced.

~~909.20.3~~909.22.3 **Testing.** Operational testing of the smoke control system shall include all equipment such as initiating devices, fans, dampers, controls, doors and windows.

~~909.20.4~~909.22.4 **Dedicated smoke control systems.** Dedicated smoke control systems shall be operated for each control sequence semiannually. The system shall be tested under standby power conditions.

~~909.20.5~~909.22.5 **Nondedicated smoke control systems.** Nondedicated smoke control systems shall be operated for each control sequence annually. The system shall be tested under standby power conditions.

~~909.20.6~~909.22.6 **Components bypassing weekly test.** Where components of the smoke control system are bypassed by the preprogrammed weekly test required by Section 909.12.1, such components shall be tested semiannually. The system shall be tested under standby power conditions.

910.3.4 Vent Operation. Smoke and heat vents shall be capable of being operated by approved automatic and manual means.

910.3.4 Fusible link temperature rating. Where vents are installed in areas provided with automatic fire sprinklers and the vents operate by fusible link, the fusible link shall have a temperature rating of 360° F (182° C).

911.1 General. Explosion control shall be provided in the following locations:

1. Where a structure, room or space is occupied for purposes involving explosion hazards as identified in Table 911.1.
2. Where quantities of hazardous materials specified in Table 911.1 exceed the maximum allowable quantities in Table 5003.1.1(1).

Such areas shall be provided with explosion (deflagration) venting, explosion (deflagration) prevention systems or barricades in accordance with this section and NFPA 68, NFPA 69, or NFPA 495 as applicable. Deflagration venting shall not be utilized as a means to protect buildings from detonation hazards.

TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS[f]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems [b]
HAZARD CATEGORY			
Combustible dusts[a]	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required

	Division 1.4 [i]	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not required	Required[h]
	Liquefied	Not required	Required[h]
Flammable liquids	IA[b]	Not required	Required
	IB[c]	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2e	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Electrochemical energy storage systems[g]		Not Required	Required
Energy storage systems[g]		Not Required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist[d]	Detonation	Required	Not permitted
	Deflagration	Not required	Required

a. Combustible dusts ~~that are generated during manufacturing or processing.~~ where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.2.2. See definition of "Combustible dust" in Chapter 2.

b. Storage or use.

c. In open use or dispensing.

d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.

e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.

f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.

g. Where explosion control is required in Section 1207.6.3.

h. Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

j. Does not apply to consumer fireworks, 1.4G.

911.5 Deflagration venting. Deflagration venting shall be of an approved type and installed in accordance with the provisions of this code and NFPA 68.

912.5 Signs. A metal sign with raised letters not less than 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 "STANDPIPE AND AUTOSPKR or AUTOSPKR AND STANDPIPE," 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.~~

912.5.1 Lettering. Each fire department connection (FDC) shall be designated by a sign with letters at least 1in (25.4mm) in height. For manual standpipe systems, the sign shall also indicate that the system is manual and that it is either wet or dry.

912.5.2 Serving multiple buildings. Where a fire department connection (FDC) services multiple buildings, structures or location, a sign shall be provided indicating the building, structures or locations served. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

912.5.3 Multiple or combined systems. Where combination or multiple system types are supplied by the fire department connection, the sign or combination of signs shall indicate both designated services.

912.5.4 Indication of pressure. The sign also shall indicate the pressure required at the outlets to deliver the standpipe system demand.

Exception: The requirements of section 912.5.4 shall not be required where the pressure required is 150 psi (10.3 bar) or less.

913.1 General. Where provided, fire pumps, for fire protection systems, shall be installed in accordance with this section and NFPA 20.

Exception: Pumps for automatic sprinkler systems installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.

913.2.2 Circuits supplying fire pumps. Cables used for survivability of circuits supplying fire pumps shall be protected using one of the following methods:

1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 1 hour.
2. Electrical circuit protective systems shall have a fire-resistance rating of not less than 1 hour. Electrical circuit protective systems shall be installed in accordance with their listing requirements.
3. Construction having a fire-resistance rating of not less than 1 hour.
4. The cable or raceway is encased in a minimum of 2 inches (50 mm) of concrete.

Exception: This section shall not apply to cables, or portions of cables, located within a fire pump room or generator room which is separated from the remainder of the occupancy with fire-resistance-rated construction.

914.2.4 Fire department access to equipment. Rooms or areas containing controls for air-conditioning systems, ~~automatic fire-extinguishing systems, automatic sprinkler systems or other detection, suppression or control elements~~ or fire protection systems shall be identified for use by the fire department.

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

Exception: An automatic sprinkler system shall not be required in spaces or areas of~~:~~

~~1.Open parking garages in accordance with Section 406.5 of the International Building Code.~~

~~2.~~Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire 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 of the International Building Code or not less than 2-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

914.3.1.1 Number of sprinkler risers and system design. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in height shall be supplied by not fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~ The number of sprinkler risers and design shall comply with Section 914.3.1.1.1 or 914.3.1.1.2 based on building height.

914.3.1.1.1 Buildings 420 feet (36.5 m) or less in height. In buildings 420 feet (36.5 m) or less in height, sprinkler systems shall be supplied by a single standpipe or *sprinkler express riser* within each *vertical water supply zone*.

914.3.1.1.2 Buildings over 420 feet (128 m) in height. In buildings over 420 feet (128 m) in height, a minimum of two standpipes or *sprinkler express risers* shall supply automatic sprinkler systems within each *vertical water supply zone*. Each standpipe or *sprinkler express riser* shall supply automatic sprinkler systems on alternating floors within the *vertical water supply zone* such that two adjacent floors are not supplied from the same riser.

~~**914.3.1.1.1**~~ **914.3.1.1.3 Riser location.** Standpipe or *sprinkler express* ~~Sprinkler~~ *risers* shall be placed in *interior exit stairways* and *ramps* that are remotely located in accordance with Section 1007.

914.3.1.2 Water supply to required fire pumps. In all buildings that are more than 420 feet (128 m) in building height, and buildings of Type IVA and IVB construction that are more than 120 feet in building height, required fire pumps shall be supplied by connections to not fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

Exception: Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through not fewer than one of the connections

914.3.2 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 in accordance with Section 903.3.1.1, shall be provided for high-rise buildings assigned to Seismic Design Category C, D, E or F as determined by the *International Building Code*. 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~~ Section 903.3.1.1.

~~**Exception:** Existing buildings.~~

914.3.6 Emergency responder ~~radio~~ communication coverage. In-building 2-way 0 communication coverage shall be provided in accordance with Section 510.

914.6 Stages. Stages shall comply with Sections 914.6.1 and 914.6.2.

914.6.1 Automatic sprinkler system. Stages shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided that the concealed space is separated from the adjacent spaces by Type X gypsum board not less than $^{5}/_{8}$ inch (15.9 mm) in thickness.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.
4. Sprinklers are not required under catwalks and galleries where they are permitted to be omitted in accordance with Section 903.3.1.1.

~~**914.6.2 Standpipe system.** Standpipe systems shall be provided in accordance with Section 905.~~

914.7 Special amusement ~~buildings~~ areas. Special amusement ~~buildings~~ areas shall comply with Sections 914.7.1 and 914.7.2.

Exceptions:

1. Special amusement areas that are without walls or a roof and constructed to prevent the accumulation of smoke need are not required to comply with this section.
2. *Puzzle rooms* provided with a *means of egress* that is unlocked, readily identifiable and always available are not required to comply with this section.

914.7.1 Automatic sprinkler system. ~~Special~~ Buildings containing special amusement ~~buildings~~ areas shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. Where the special amusement ~~building~~ area is temporary, the sprinkler water supply shall be of an *approved* temporary means.

Exception: Automatic sprinklers are not required where the total floor area of a temporary special amusement area is less than 1,000 square feet (93 m^2) and the *exit access* travel distance from any point in the special amusement area to an *exit* is less than 50 feet (15 240 mm).

914.7.2 Detection and alarm systems. ~~Automatic smoke detection~~. Buildings containing *special* ~~Special~~ amusement ~~buildings~~ areas shall be equipped throughout with an *automatic smoke detection* system and an *emergency voice/alarm communications* system in accordance with Section 907 ~~907.2.11~~. Pre-signal alarms and alarm activation shall comply with Sections 914.7.2.1 and 914.7.2.2, and *emergency voice/alarm communications* systems shall comply with Section 914.7.2.3.

914.7.2.1 Alarm pre-signal. Activation of any single smoke detector, the *automatic sprinkler system* or any other single automatic fire detection device shall immediately initiate an audible and visible alarm at a constantly attended location at the *special amusement area* from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 914.7.2.2.

914.7.2.2 Alarm activation. Activation of two or more smoke detectors, a single smoke detector equipped with an alarm verification feature, two or more other approved fire detection devices, the *automatic sprinkler system* , or a manual control located at the constantly attended station required by Section 914.7.2.1 shall automatically accomplish all of the following:

1. Illuminate the means of egress with an illumination level not less than 1 footcandle (11 lux) at the walking surface level.
2. Stop conflicting or confusing sounds and visual distractions.
3. Activate approved directional exit markings.
4. Activate a prerecorded message, audible throughout the special amusement area, instructing occupants to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound that is distinct from other sounds used during normal operation of the *special amusement area*.

914.7.2.3 Emergency voice/alarm communications system. An *emergency voice/alarm communications* system complying with Section 907.5.2.2 shall be installed in and audible throughout *special amusement areas*. The *emergency voice/alarm communications* system is allowed to also serve as a public address system.

[NY] 915.1 General. New and existing ~~residential buildings and commercial~~ buildings shall be provided with carbon monoxide (CO) detection and notification in accordance with ~~this~~ Sections ~~915~~ 915.2 through 915.5.

~~**Exceptions:**~~

~~1. Carbon monoxide detection and notification shall not be required for any of the following:~~

~~1.1. Buildings that are classified in their entirety as a Storage Group S occupancy or a Utility and Miscellaneous Group U occupancy and that are occupied only occasionally for retrieval of stored material, equipment, or products, or for building or equipment maintenance,~~

~~1.2. Occupiable space when such space is regularly vented to the exterior through the normal operation of the space (such as automotive repair garages, warehouses with loading dock doors that are regularly open, etc.), and when approved by the fire code official, or~~

~~1.3. Buildings that satisfy all of the following conditions:~~

~~a. The building is unoccupied;~~

~~b. Exterior openings are boarded, locked, blocked, or otherwise protected to prevent entry by unauthorized individuals;~~

~~c. All fuel-burning appliances are disabled in a manner that makes them incapable of producing carbon monoxide; and~~

~~d. All attached motor vehicle related occupancies are boarded, locked, blocked, or otherwise protected to prevent entry by motor vehicles and equipment.~~

~~2. Existing buildings that are in full compliance with the carbon monoxide detection and notification requirements of the 2017 Uniform Code Supplement or an earlier version of the Uniform Code shall be deemed to be in full compliance with Sections 915.3 through 915.5.4 unless otherwise required by the Residential Code of New York State, Building Code of New York State, Fire Code of New York State, or Existing Building Code of New York State. Existing buildings that are not in full compliance with the carbon monoxide detection requirements of the 2017 Uniform Code Supplement or an earlier version of the Uniform Code shall comply with the requirements of this section.~~

[NY] 915.2 Where required. Carbon monoxide detection shall be provided in interior spaces, other than dwelling units or sleeping units, that are exposed to a *carbon monoxide source* in accordance with Sections 915.2.1 through 915.2.3. Carbon monoxide detection for dwelling units or sleeping units that are exposed to a *carbon monoxide source* shall be in accordance with Section 915.2.4.

~~**[NY] 915.2 Definitions.** For the purposes of applying Section 915, the following terms shall have the following meanings:~~

~~**CARPORT.** A structure that is used for parking, storage, or repair of equipment and/or vehicles, and consists of a roof and at least one side that is open to the atmosphere.~~

~~**COMMERCIAL BUILDING.** A building that is not a residential building.~~

~~**COMMUNICATING OPENING.** A pathway by which air can freely flow from a room to another room. Communicating openings shall include, but shall not be limited to, elevator shafts, open stairways, archways, transfer ducts and grilles, concealed spaces, interior hallways, and pass-through windows.~~

~~**DWELLING UNIT.** A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation. Dwelling units include, but are not limited to, a one-family dwelling, each unit in a two-family dwelling, each unit in a multiple single-family dwelling (townhouse), lodging houses, bed and breakfast dwellings, apartments, condominiums, and dormitory suites having living areas, bedrooms, bathrooms, and kitchens. This term shall apply regardless of whether the unit is a permanent residence or a rental unit.~~

~~**FUEL-BURNING APPLIANCE.** Any appliance, equipment, device, machine, or system that may emit carbon monoxide. Examples of fuel-burning appliances include, but are not limited to, fireplaces, wood stoves, fuel-fired~~

~~furnaces, fuel-fired boilers, space heaters with pilot lights or open flames, kerosene heaters, stoves, ovens, ranges, gas-powered clothes dryers, refrigerators that use gas or liquid fuel, generators, engines, torches, forklifts, compressors, pumps, welding equipment, pressure washers, and fuel-powered tools.~~

~~**MOTOR VEHICLE RELATED OCCUPANCY.** A building or portion thereof that is used for parking, storage, or repair of equipment and/or vehicles. The term motor vehicle related occupancy shall exclude structures that meet the definition of a carport or an open parking garage.~~

~~**OCCUPIABLE SPACE.** A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational, or similar purposes, or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.~~

~~**RESIDENTIAL BUILDING.** A building that is a one-family dwelling, a two-family dwelling, or a building containing only townhouses.~~

~~**SLEEPING AREA.** A room or space that can be used, either on an occasional or permanent basis, for sleeping. Sleeping areas include, but are not limited to, bedrooms, finished rooms in basements, family rooms, recreation rooms or other similar areas in residential buildings, and places where children sleep in a day care facility.~~

~~**SLEEPING UNIT.** A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities, but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units. Sleeping units include, but are not limited to, dormitory suites with living areas, bedrooms, and bathrooms; hotel guest rooms; bedrooms in boarding houses; patient sleeping rooms in hospitals, nursing homes or assisted living facilities; housing cells in a jail; or studio apartments with a kitchenette (i.e., countertop microwave, sink, refrigerator, and without a cooktop, range, or oven).~~

[NY] 915.2.1 Interior spaces with direct carbon monoxide sources. In all occupancies, interior spaces with a *direct carbon monoxide source* shall be provided with carbon monoxide detection located in close proximity to the *direct carbon monoxide source* and in accordance with Section 915.3.

> **Exception:** Where environmental conditions in an enclosed space are incompatible with carbon monoxide detection devices, carbon monoxide detection shall be provided in an *approved* adjacent location.

[NY] 915.2.2 Interior spaces adjacent to a space containing a carbon monoxide source. In *Groups A, B, E, I, M and R Occupancies*, interior spaces that are separated from and adjacent to an enclosed parking garage or an interior space that contains a *direct carbon monoxide source* shall be provided with carbon monoxide detection if there are communicating openings between the spaces. Detection devices shall be located in close proximity to communicating openings on the side that is furthest from the *carbon monoxide source* and in accordance with Section 915.3

Exceptions:

1. Where communicating openings between the space containing a direct carbon monoxide source and the adjacent space are permanently sealed airtight, carbon monoxide detection is not required for the adjacent space.
2. Where the fire code official determines that the volume or configuration of the adjacent interior space is such that dilution or geometry would diminish the effectiveness of carbon monoxide detection devices located in such spaces, detection devices additional to those required by Section 915.2.1 shall be located on the side of communicating openings that is closest to the carbon monoxide source.

[NY] 915.2.3 Interior spaces with forced-indirect carbon monoxide sources. In all occupancies, interior spaces with a *forced-indirect carbon monoxide source* shall be provided with carbon monoxide detection in accordance with either of the following:

1. Detection in each space with a forced-indirect carbon monoxide source, located in accordance with Section 915.3.
2. Detection only in the first space served by the main duct leaving the forced-indirect carbon monoxide source, located in accordance with Section 915.3, with an audible and visual alarm signal provided at an approved location.

[NY] 915.2.4 Dwelling units and sleeping units. Carbon monoxide detection for *dwelling units* and *sleeping units* shall comply with Sections 915.2.4.1 and 915.2.4.2.

[NY] 915.2.4.1 Direct carbon monoxide sources. Where a *direct carbon monoxide* source is located in a bedroom or sleeping room, or a bathroom attached to either, carbon monoxide detection shall be installed in the bedroom or sleeping room.

Where carbon monoxide detection is not installed in bedrooms or sleeping rooms, carbon monoxide detection shall be installed outside of each separate sleeping area in close proximity to bedrooms or sleeping rooms for either of the following conditions:

1. The dwelling unit or sleeping unit has an attached, enclosed garage.
2. A direct carbon monoxide source is located in the dwelling unit or sleeping unit outside of bedrooms or sleeping rooms.

[NY] 915.2.4.2 Forced-indirect carbon monoxide sources. Bedrooms or sleeping rooms in dwelling units or sleeping units that are exposed to a forced-indirect carbon monoxide source shall be provided with carbon monoxide detection in accordance with Section 915.2.4.1 or Section 915.2.3.

[NY] 915.3 Location of ~~D~~detection ~~locations~~ devices. Carbon monoxide detection devices shall be installed in ~~the locations specified in Sections 915.3 through 915.3.3 plus any additional locations as required by the~~ accordance with manufacturer's instructions ~~of the carbon monoxide detection device. All carbon monoxide detectors shall be installed~~ in a location~~s~~ that avoid dead air spaces, turbulent air spaces, fresh air returns, open windows, ~~HVAC ducts, closed doors,~~ and ~~other such~~ obstructions that ~~could prevent~~ would inhibit accumulation of carbon monoxide ~~from reaching~~ at the ~~detector~~ detection location. ~~Where there is a conflict between the location requirements specified by this code and the location requirements specified by the manufacturer of the carbon monoxide detection device, the more restrictive shall govern.~~ Carbon monoxide detection in air ducts or plenums shall not be permitted as an alternative to required detection locations.

> ~~**Exception:** Where Sections 915.3 through 915.3.3 require a room or area to be protected by multiple carbon monoxide detectors, one carbon monoxide detector may be provided in an approved location that satisfies all applicable requirements of Sections 915.3.1 through 915.3.3 or otherwise provides the room or area with adequate protection. The level of protection in adjacent rooms shall not be reduced by the elimination of an otherwise required detector.~~

~~**[NY] 915.3.1 Residential buildings and commercial buildings that contain a fuel-burning appliance.** Carbon monoxide detection shall be installed in residential buildings and commercial buildings in all rooms, occupiable space, dwelling units, sleeping areas, and sleeping units that contain a fuel-burning appliance.~~

> ~~**Exceptions:**~~
>
> ~~1. In sleeping areas and sleeping units where a fuelburning appliance is located in an attached bathroom, utility room, closet, or space, a carbon monoxide detector shall be installed in a central or otherwise approved location in the sleeping area or sleeping unit.~~
> ~~2. In dwelling units and sleeping units where a fuelburning appliance is located in a kitchen or kitchenette, a carbon monoxide detector shall be installed outside of the sleeping areas and within 10 feet (3048 mm) of the entrance to the sleeping areas.~~

~~**[NY] 915.3.1.1 Rooms with an elevator shaft.** When a room containing a fuel-burning appliance also contains an elevator that provides access to an upper level of a building, the carbon monoxide detector shall be installed between the fuel-burning appliance and the elevator.~~

~~**[NY] 915.3.1.2 Rooms with communicating openings.** Carbon monoxide detection shall be installed in a central or otherwise approved location in occupiable space, sleeping areas, and sleeping units that have a direct communicating opening to a room that contains a fuel-burning appliance.~~

~~**[NY] 915.3.1.3 Dwelling units and sleeping units that contain a fuel-burning appliance.** Carbon monoxide detection shall be installed outside of sleeping areas and within 10 feet (3048 mm) of the entrance to the sleeping areas in dwelling units and sleeping units that contain a fuel-burning appliance.~~

> ~~**Exception:** Carbon monoxide detection shall be installed in sleeping areas when required by Sections 915.3.1 through 915.3.1.2, Section 915.3.2, or Section 915.3.3, as applicable.~~

[NY] 915.3.2 Commercial buildings served by a fuelburning forced-air furnace. Carbon monoxide detection shall be installed in a central or otherwise approved location in commercial buildings in the following locations when such location is served by a fuel-burning forced-air furnace:

Exceptions:

3. Carbon monoxide detection shall not be required to be installed in accordance with Section 915.3.2, Items 1 or 2, where carbon monoxide detection is provided in each main duct leaving the furnace and the carbon monoxide alarm signals are automatically transmitted to an approved location that provides occupant notification.

4. Carbon monoxide detection shall not be required in sleeping areas, sleeping units, sleeping areas in day care facilities, and in every classroom in a Group E occupancy if a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace and the carbon monoxide alarm signals are automatically transmitted to an approved location that provided occupant notification.

[NY] 915.3.3 Residential buildings and commercial buildings with an attached motor vehicle related occupancy. Carbon monoxide detection shall be installed in a central or otherwise approved location in each occupiable space in a commercial building and within 10 feet (3048 mm) of the entrance to sleeping areas and sleeping units in residential buildings and commercial buildings that:

1. Have a communicating opening with an attached motor vehicle related occupancy,
2. Share one or more common walls with an attached motor vehicle related occupancy, or
3. Are located one story above or below a motor vehicle related occupancy.

Exceptions: Carbon monoxide detection shall not be required:

1. Where a motor vehicle related occupancy connects to a building through an open-ended corridor, or
2. Where a carbon monoxide detector is provided in an approved location between a room and the motor vehicle related occupancy and the carbon monoxide alarm signals are automatically transmitted to an approved location that provides occupant notification.

[NY] 915.4 Carbon monoxide alarms and detection systems. Carbon monoxide detection shall be provided by either carbon monoxide alarms complying with Section 915.4.1 or carbon monoxide detection systems complying with Section 915.4.2.

[NY] 915.4 Permissible detection devices. Carbon monoxide detection shall be provided by a carbon monoxide detection system complying with Section 915.4.2 unless *carbon monoxide alarms* are permitted by Sections 915.4.1.

[NY] 915.4.1 Carbon monoxide alarms. *Carbon monoxide alarms* complying with Sections 915.4.1.1 through 915.4.1.3 shall ~~only~~ be ~~installed in~~ permitted in lieu of a carbon monoxide detection system in both of the following:

1. ~~d~~Dwelling units, sleeping areas, and sleeping units ~~and shall not be installed in locations where the code requires carbon monoxide detectors to be used. Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.5.4.~~
2. Locations other than dwelling units or sleeping units, where approved, provided that the manufacturer's instructions do not prohibit installation in locations other than dwelling units or sleeping units and that the alarm signal for any carbon monoxide alarm installed in a normally unoccupied location is annunciated by an audible and visual signal in an approved location.

Exception: Carbon monoxide alarms shall be allowed in buildings and spaces other than dwelling units, sleeping areas, and sleeping units in accordance with the exception to Section 915.4.1.1.

[NY] 915.4.1.1 Power source. In buildings with a wired power source, ~~C~~*carbon monoxide alarms* shall receive their primary power from a permanent connection to the building wiring, with no disconnecting means other than for overcurrent protection, and shall be provided with a battery backup. In buildings without a wired power source, carbon monoxide alarms shall be battery powered. ~~where such wiring is served from a commercial source, and when primary~~

~~power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.~~

Exception~~s~~: For existing buildings not previously required to have carbon monoxide alarms permanently connected to a wired power source, existing battery-powered and plug-in with battery backup carbon monoxide alarms shall be permitted to remain in service. When replaced, replacement with battery-powered and plug-in with battery backup carbon monoxide alarms shall be permitted.

~~1. Carbon monoxide alarms powered by a 10-year battery shall be an acceptable alternative in residential buildings and commercial buildings without commercial power, and~~

~~1.1. Existing residential buildings and commercial buildings unless otherwise required by the Uniform Code.~~

~~2. Carbon monoxide alarms installed in accordance with an earlier version of the Uniform Code may be cord-type or direct plug when permitted by such code.~~

[NY] 915.4.1.2 ~~Carbon monoxide alarm listing~~ Listings. *Carbon monoxide alarms* shall be *listed* ~~and labeled as complying with UL 2034 or CAN/CSA 6.19~~ in accordance with UL 2034. Combination carbon monoxide/smoke alarms shall also be listed in accordance with UL 217.

~~**Exception:** For uses and occupancies regulated by the Occupational Safety and Health Administration (OSHA), carbon monoxide alarms and carbon monoxide detectors that activate at levels in accordance with 49 CFR 1917.24(a), shall not be required to be listed in accordance with UL 2034 or CAN/CSA 6.19. Such carbon monoxide alarms and carbon monoxide detectors that are connected to fire alarm control panels shall be connected utilizing connections listed for fire alarm service.~~

~~**[NY] 915.4.1.3 Combination alarms.** A combination carbon monoxide/smoke alarm shall be an acceptable alternative to a carbon monoxide alarm, provided that:~~

~~1. The combination alarm is installed in a location and in a manner that satisfies the Uniform Code requirements for both carbon monoxide alarms and smoke alarms, or~~

~~2. The room(s), area(s), or space(s) that the combination alarm serves are also served by a code-compliant smoke alarm or fire alarm system in the instances that a smoke alarm or fire alarm system is required by the Uniform Code.~~

~~**[NY] 915.4.1.3.1 Combination alarm listing.** Combination alarms shall be listed and labeled as complying with UL 2034 and UL 217.~~

~~**Exception:** For uses and occupancies regulated by the Occupational Safety and Health Administration (OSHA), carbon monoxide alarms and carbon monoxide detectors that activate at levels in accordance with 49 CFR 1917.24(a), shall not be required to be listed in accordance with UL 2034. Such carbon monoxide alarms and carbon monoxide detectors that are connected to fire alarm control panels shall be connected utilizing connections listed for fire alarm service.~~

~~**[NY] 915.4.1.4 Installation requirements.** Where required by Sections 915.1 through 915.5.2, carbon monoxide alarms shall be installed in accordance with Section 915, NFPA 720, and the manufacturer's installation instructions. Where there is a conflict between the requirements of this code, NFPA 720, and the manufacturer's installation instructions, the manufacturer's installation instructions shall govern.~~

[NY] 915.4.1.3 Interconnection. Where more than one *carbon monoxide alarm* is installed, actuation of any alarm shall cause all of the alarms to signal an alarm condition.

[NY] 915.4.2 Carbon monoxide detection systems. Carbon monoxide detection systems shall be ~~an acceptable alternative to carbon monoxide alarms. Carbon monoxide detection systems shall comply with Sections 915.5.1 through 915.5.3.~~ installed in accordance with NFPA 72.

[NY] 915.4.2.1 Fire alarm system integration. Where a building fire alarm system or combination fire alarm system, as defined in NFPA 72, is installed, carbon monoxide detection shall be provided by connecting *carbon monoxide detectors* to the fire alarm system. Where a building fire alarm system or a combination fire alarm system is not

installed, carbon monoxide detection shall be provided by connecting *carbon monoxide detectors* to a carbon monoxide detection system complying with NFPA 72.

[NY] ~~**915.4.2.1**~~ **915.4.2.2 Carbon monoxide detector listing.** *Carbon monoxide detectors* shall be *listed* ~~and labeled~~ as complying with UL 2075. Combination carbon monoxide/smoke detectors shall be listed in accordance with UL 268 and UL 2075.

> ~~**Exception:** For uses and occupancies regulated by the Occupational Safety and Health Administration (OSHA), carbon monoxide alarms and carbon monoxide detectors that activate at levels in accordance with 49 CFR 1917.24(a), shall not be required to be listed in accordance with UL 2075. Such carbon monoxide alarms and carbon monoxide detectors that are connected to fire alarm control panels shall be connected utilizing connections listed for fire alarm service.~~

~~**[NY] 915.4.2.2 Combination detector listing.** Combination carbon monoxide/smoke detectors that are listed and labeled as complying with UL 2075 and UL 268 shall be an acceptable alternative to carbon monoxide detectors in carbon monoxide detection systems.~~

> ~~**Exception:** For uses and occupancies regulated by the Occupational Safety and Health Administration (OSHA), carbon monoxide alarms and carbon monoxide detectors that activate at levels in accordance with 49 CFR 1917.24(a), shall not be required to be listed in accordance with UL 2075. Such carbon monoxide alarms and carbon monoxide detectors that are connected to fire alarm control panels shall be connected utilizing connections listed for fire alarm service.~~

~~**[NY] 915.4.2.3 Power source.** The power source for carbon monoxide detection systems shall comply with NFPA 720.~~

~~**[NY] 915.4.3 Alternative listing.** Products that are listed for fire service and that meet the requirements of NFPA 720 Section 4.3.4 shall be deemed to meet the listing requirements of Section 915.~~

[NY] 915.4.2.3 Alarm notification. For other than Group E Occupancies, activation of a *carbon monoxide detector* shall initiate alarm notification in accordance with any of the following:

1. An audible and visible alarm notification throughout the building and at the control unit.
2. Where specified in an approved fire safety plan, an audible and visible alarm in the signaling zone where the carbon monoxide has been detected and other signaling zones specified in the fire safety plan, and at the control unit.
3. Where a sounder base is provided for each detector, an audible alarm at the activated carbon monoxide detector and an audible and visible alarm at the control unit.

For Group E Occupancies having an occupant load of 30 or less, alarm notification shall be provided in an on-site location staffed by school personnel or in accordance with the notification requirements for other occupancies. For Group E occupancies having an occupant load of more than 30, an audible and visible alarm shall be provided in an on-site location staffed by school personnel.

~~**[NY] 915.5 Occupant notification.** Building occupants shall be notified of the presence of carbon monoxide through the use of audible notification, visible notification, or both. The selection, design, and location of notification appliances shall be in accordance with this Section 915 and NFPA 720.~~

~~**[NY] 915.5.1 Audible notification.** The selection, design, and location of audible notification appliances shall be based on the sound pressure level produced by the appliance, the average ambient sound level in the room being protected, and the maximum sound level in the room being protected. The anticipated average ambient sound level and maximum sound level shall be consistent with the proposed use. The average ambient sound level shall be determined in accordance with any of the following:~~

~~1. NFPA 720, Table A.6.4.2 (Average Ambient Sound Level According to Location),~~

2. The actual sound levels in the room being protected as determined and documented by the system designer, or

3. Approved published literature.

[NY] 915.5.1.1 Maximum distance between audible notification appliances. The maximum distance between audible notification appliances shall not exceed 55 feet (16 764 mm) for any occupancy when NFPA 720 Table A.6.4.2 is applied.

[NY] 915.5.1.2 Additional audible alarms. Additional audible alarms shall be:

1. Installed in sufficient locations to ensure compliance with Sections 915.5 through 915.5.1.1,

2. Provided to ensure that not more than one door or wall is located between an audible alarm and an occupiable space, sleeping area, or sleeping unit, and

3. Located in areas that comply with the requirements of Section 915 and the manufacturer's installation instructions.

[NY] 915.5.2 Visible alarm notification. Visible carbon monoxide alarm notification appliances shall be installed in new commercial buildings in the instances that the code requires visible smoke alarms. Visible alarms shall be activated by the in-room carbon monoxide alarm or detector.

[NY] 915.5.3 Interconnection of multiple carbon monoxide notification appliances. When more than one carbon monoxide alarm is installed in a dwelling unit, sleeping unit, sleeping area, occupiable space, or HVAC zone, all such alarms shall be interconnected in such a manner that the activation of one alarm or detector shall activate all carbon monoxide notification appliances throughout the individual dwelling unit, sleeping unit, sleeping area, occupiable space, or HVAC zone. Interconnection of alarms shall comply with NFPA 720 Sections 9.6.4.1 through 9.6.4.5 and 9.6.7.

Exception: Interconnection is not required where battery operated, cord-type or direct plug carbon monoxide alarms or detectors are permitted.

[NY] 915.5.4 Group E occupancies and I-2 hospitals. Carbon monoxide alarm signals shall be automatically transmitted to an on-site staffed location in Group E occupancies and I-2 hospitals.

Exceptions:

1. Group E occupancies with an occupant load of 30 or less.

2. Existing buildings with carbon monoxide alarms powered by a 10-year battery, plug-in, or chordtype appliance.

3. Existing Group I-2 hospitals.

[NY] 915.6 915.5 Maintenance and replacement. *Carbon monoxide alarms*, carbon monoxide detectors, carbon monoxide detection systems, and alarm control units shall be maintained in good working order in accordance with Section 915, NFPA 720, and the manufacturer's instructions/recommendations. *Carbon monoxide alarms* and *carbon monoxide detectors* shall be replaced when they that become inoperable, cease to operate as intended, or begin producing end-of-life signals, or when otherwise required by the manufacturer's instructions or manufacturer's recommendations shall be replaced.

[NY] 915.6.1 Existing buildings with hardwired alarms. Carbon monoxide detection and notification devices that receive primary power from the building wiring and that are installed pursuant to an earlier version of the Uniform Code and in full compliance with such earlier code shall be maintained in accordance with the requirements of such code.

[NY] 915.6.2 Existing buildings with a battery, plug, or cord-powered carbon monoxide alarm. Carbon monoxide alarms that are powered solely by a battery, plug, or cord shall be maintained in an operating condition. At such time that the battery, plug, or cord-powered carbon monoxide alarm fails to operate or otherwise requires replacement, a new carbon monoxide alarm that is powered by either a 10-year battery or the building's wiring shall be installed in the location and in the manner required by Section 915, plus any additional carbon monoxide alarms as necessary to satisfy the location and notification requirements of Section 915.

[NY] 915.6.2.1 Replaced alarms. When an existing battery, plug, or cord-powered alarm is replaced pursuant to Section 915.6.2, the installation of one or more new alarms to satisfy the requirements of Section 915 shall include the installation of additional smoke alarms, carbon monoxide alarms, combination alarms, or any combination thereof as

~~necessary to ensure that the level of protection that had been afforded by a carbon monoxide alarm or combination alarm is not reduced by the installation of a new alarm in a new location for the purpose of satisfying the requirements of this section.~~

~~**[NY] 915.6.3 Enclosed parking garages.** Carbon monoxide and nitrogen dioxide detectors installed in enclosed parking garages in accordance with Section 404.1 of the Mechanical Code of New York State shall be maintained in accordance with the manufacturer's instructions and their listing. Detectors that become inoperable or begin producing end-of-life signals shall be replaced.~~

~~**[NY] 915.6.4 Testing.** Carbon monoxide alarms, carbon monoxide detectors, carbon monoxide detection systems, and alarm control units shall be periodically tested in accordance with NFPA 720 and the manufacturer's instructions.~~

917.1 College and university campuses. Prior to construction of a new building requiring a fire alarm system on a multiple-building college or university campus having a cumulative building *occupant load* of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an *approved* mass notification system shall be provided in accordance with the findings of the risk analysis.

917.2 Group E Occupancies. Prior to construction of a new building containing a Group E occupancy requiring a fire alarm system having an occupant load of 500 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis.

CHAPTER 10 MEANS OF EGRESS

SECTION 1002

DEFINITIONS

[BE] 1002.1 Definitions. The following terms are defined in **Chapter 2**:

ACCESSIBLE MEANS OF EGRESS .

AISLE .

AISLE ACCESSWAY .

ALTERNATING TREAD DEVICE .

AREA OF REFUGE .

BLEACHERS .

BREAKOUT .

COMMON PATH OF EGRESS TRAVEL .

CORRIDOR .

DOOR, BALANCED .

EGRESS COURT .

EMERGENCY ESCAPE AND RESCUE OPENING .

EXIT .

EXIT ACCESS .

EXIT ACCESS DOORWAY .

EXIT ACCESS RAMP .

EXIT ACCESS STAIRWAY .

EXIT DISCHARGE .

EXIT DISCHARGE, LEVEL OF .

EXIT PASSAGEWAY .

EXTERIOR EXIT RAMP .

EXTERIOR EXIT STAIRWAY .

FIRE EXIT HARDWARE .

FIXED SEATING .

FLIGHT .

FLOOR AREA, GROSS .

FLOOR AREA, NET .

FOLDING AND TELESCOPIC SEATING .

GRADE FLOOR EMERGENCY ESCAPE AND RESCUE OPENINGS ..

…

1003.3.1 Headroom. Protruding objects are permitted to extend below the minimum ceiling height required by Section 1003.2 where a minimum headroom of 80 inches (2032 mm) is provided over any circulation paths, including walks, *corridors*, *aisles* and passageways. Not more than 50 percent of the ceiling area of a *means of egress* shall be reduced in height by protruding objects.

> **Exception:** ~~Door closers and stops shall not reduce headroom to less than 78 inches (1981 mm).~~ Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door locks shall be permitted to project into the door opening height not lower than 78 inches (1980 mm) minimum above the floor.

A barrier shall be provided where the vertical clearance above a *circulation path* is less than 80 inches (2032 mm) high above the finished floor. The leading edge of such a barrier shall be located 27 inches (686 mm) maximum above the finished floor.

1003.5 Elevation change. Where changes in elevation of less than 12 inches (305 mm) exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), ramps complying with Section 1012 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

Exceptions:

> 1. ~~A single step with a maximum riser height of 7 inches (178 mm) is permitted for buildings with occupancies in Groups F, H, R-2, R-3, S and U at exterior doors not required to be accessible by Chapter 11.~~ Steps at exterior doors complying with Section 1010.1.4.
>
> 2. A stair with a single riser or with two risers and a tread is permitted at locations not required to be accessible by Chapter 11 where the risers and treads comply with Section 1011.5, the minimum depth of the tread is 13 inches (330 mm) and not less than one handrail complying with Section 1014 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the stair.

Throughout a story in a Group I-2 occupancy, any change in elevation in portions of the means of egress that serve nonambulatory persons shall be by means of a ramp or sloped walkway.

Portions of table not shown remain unchanged.

TABLE 1004.5

MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR [a]
Business areas	150 gross
Concentrated business use areas	See Section 1004.8
Information Technology Equipment Facilities	300 gross

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

a. Floor area in square feet per occupant.

Revise all instances of occupied with occupiable (occupiable ~~occupied~~) and unoccupied with unoccupiable (unoccupiable ~~unoccupied~~) in the title (as shown below) and/or body of the following sections:

1004.7 Outdoor areas…

1004.8 Concentrated business use areas. The *occupant load* factor for concentrated business use shall be applied to telephone call centers, trading floors, electronic data entry ~~processing~~ centers and similar business use areas with a higher density of occupants than would normally be expected in a typical business occupancy environment. Where approved by the *building official*, the *occupant load* for concentrated business use areas shall be the actual *occupant load*, but not less than one occupant per 50 square feet (4.65 m^2) of gross occupiable floor space.

1006.1 General. The number of exits or exit access doorways required within the means of egress system shall comply with the provisions of Section 1006.2 for spaces, including mezzanines, and Section 1006.3 for stories or ~~occupied~~ occupiable roofs.

1006.2.1 Egress based on occupant load and common path of egress travel distance. Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the values listed in Table1006.2.1. The cumulative occupant load from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.

Exceptions:

1.The number of exits from foyers, lobbies, vestibules or similar spaces need not be based on cumulative occupant loads for areas discharging through such spaces, but the capacity of the exits from such spaces shall be based on applicable cumulative occupant loads.

2.Care suites in Group I-2 occupancies complying with Section 407.4.

3.Unoccupied mechanical rooms and penthouses are not required to comply with the common path of egress travel distance measurement.

[BE] TABLE 1006.2.1

SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Automatic Sprinkler System (feet)		With Automatic Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL > 30	
Ac, E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2d, I-4	10	NP	NP	75[a]

I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
Sf	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2

b. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.

c. For a room or space used for assembly purposes having fixed seating, see Section 1030.8.

d. For the travel distance limitations in Group I-2, see Section 407.4 of the International Building Code.

e. The common path of egress travel distance shall apply only in a Group R-3 occupancy located in a mixed occupancy building or within a Group R-3 or R-4 congregate living facility.

f. The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

g. For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3, see Section 1006.2.2.6.

1006.2.2 Egress based on use. The numbers, configuration, and types of components of exits or access to exits shall be provided in the uses described in Sections 1006.2.2.1 through 1006.2.2.6.

1006.2.2.2 Refrigeration machinery rooms. Machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two *exits* or exit access doorways. Where two *exit access doorways* are required, one such doorway is permitted to be served by a fixed ladder or an *alternating tread device*. *Exit access doorways* shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room. Exit access travel distance shall be determined as specified in Section 1017.1, but all portions of a refrigeration machinery room shall be within 150 feet (45 720 mm) of an exit or exit access doorway where such rooms are not protected by an approved automatic sprinkler system. Egress is allowed through adjoining refrigeration machinery rooms or adjoining refrigerated rooms or spaces.

~~All portions of machinery rooms shall be within 150 feet (45 720 mm) of an *exit* or *exit access doorway*. An increase in exit access travel distance is permitted in accordance with Section 1017.1.~~

Exit and *exit access doorways* shall swing in the direction of egress travel and shall be equipped with panic hardware, regardless of the *occupant load* served. Exit and *exit access doorways* shall be tight fitting and *self-closing*.

1006.2.2.4 Electrical rooms. The location and number of exit or exit access doorways shall be provided for electrical rooms in accordance with Section 110.26 of NFPA 70 for electrical equipment rated 1000V or less, and Section 110.33 of NFPA 70 for electrical equipment rated over 1000V. Panic hardware shall be provided where required in accordance with Section 1010.2.8.2.

~~**1006.2.2.4 Group I-4 means of egress.** Group I-4 facilities, rooms or spaces where care is provided for more than 10 children that are 2½ years of age or less, shall have access to not less than two exits or exit access doorways.~~

1006.3 Egress from stories or ~~occupied~~ occupiable roofs. ~~The means of egress system serving any story or occupied roof shall be provided with the~~ All spaces located on a story or occupiable roof shall have access to the required number of separate and distinct *exits* or access to *exits* based on the aggregate *occupant load* served in accordance with this section. ~~Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required number of exits or access to exits serving that story.~~

1006.3.1 Occupant load. Where stairways serve more than one story, or more than one story and an occupiable roof, only the occupant load of each story or occupiable roof, considered individually, shall be used in when calculating the required number of exits or access to exits serving that story.

~~**1006.3.1**~~**1006.3.2** ~~**Adjacent story.**~~ **Path of egress travel.** The path of egress travel to an exit shall not pass through more than one adjacent story.

Exception: The path of egress travel to an exit shall be permitted to pass through more than one adjacent story in any of the following:

1. In Group R-1, R-2 or R-3 occupancies, exit access stairways and ramps connecting four stories or less serving and contained within an individual dwelling unit, sleeping unit or live/work unit.
2. Exit access stairways serving and contained within a Group R-3 congregate residence or a Group R-4 facility.
3. Exit access stairways and ramps within an atrium complying with Section 404 of the International Building Code.
4. Exit access stairways and ramps in open parking garages that serve only the parking garage.
5. Exit access stairways and ramps serving smoke-protected assembly seating and open-air assembly seating complying with the exit access travel distance requirements of Section 1029.7.
6. Exit access stairways and ramps between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.
7. Exterior exit access stairways and ramps between occupiable roofs.

~~**1006.3.2**~~**1006.3.3 Egress based on occupant load.** Each story and ~~occupied~~ occupiable roof shall have the minimum number of separate and distinct exits, or access to exits, as specified in Table 1006.3.~~2~~3. A single exit or access to a single exit shall be permitted in accordance with Section 1006.3.~~3~~4. The required number of exits, or exit access stairways or ramps providing access to exits, from any story or ~~occupied~~ occupiable roof shall be maintained until arrival at the exit discharge or a public way.

[BE] TABLE 1006.3.~~2~~3

MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

TABLE 1006.3.3

MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY OR OCCUPIABLE ROOF

OCCUPANT LOAD PER STORY OR OCCUPIABLE ROOF	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS ~~FROM~~ PER STORY OR OCCUPIABLE ROOF
1-500	2
501-1,000	3
More than 1,000	4

1006.3.~~3~~4 Single exits. A single *exit* or access to a single *exit* shall be permitted from any *story* or ~~occupied~~ occupiable roof where one of the following conditions exists:

1. The *occupant load*, number of *dwelling units* and ~~common path of egress~~ exit access travel distance do not exceed the values in Table 1006.3.~~3~~4 (1) or 1006.3.~~3~~4 (2).
2. Rooms, areas and spaces complying with Section 1006.2.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit* or access to a single *exit*.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one *exit* or access to a single *exit*.
4. Group R-3 and R-4 occupancies shall be permitted to have one *exit* or access to a single *exit*.
5. Individual single-story or multistory *dwelling units* shall be permitted to have a single *exit* or access to a single *exit* from the *dwelling unit* provided that both of the following criteria are met:

   5.1 The *dwelling unit* complies with Section 1006.2.1 as a space with one *means of egress*.

   5.2 Either the exit from the *dwelling unit* discharges directly to the exterior at the *level of exit discharge*, or the *exit access* outside the *dwelling unit's* entrance door provides access to not less than two *approved* independent *exits*.

TABLE 1006.3.~~3~~4 (1)

STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES

STORY OR OCCUPIED ROOF	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM ~~COMMON PATH OF EGRESS~~ EXIT ACCESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane and occupiable roofs over the first or second story above grade plane	R-2[a, b, c]	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1031.

b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.4(2).

c. This table is for occupied roofs accessed through and serving individual dwelling units in Group R-2 occupancies. For Group R-2 occupancies with occupiable roofs that are not accessed through and serving individual units, use Table 1006.3.4(2).

TABLE 1006.3.~~3~~4 (2)

STORIES AND OCCUPIABLE ROOFS WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

STORY AND OCCUPIEABLE ROOF	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY AND OCCUPIABLE ROOF	MAXIMUM ~~COMMON PATH OF EGRESS~~ EXIT ACCESS

			TRAVEL DISTANCE (feet)
First story above or below grade plane and occupiable roofs over the first story above grade plane	A, B[b], E, F[b], M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R- 1, R-2[a, c]	10	75
	Sb, d	29	75
Second story above grade plane	B, F, M, S[d]	29	75
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm. NP = Not Permitted. NA = Not Applicable.

a. Buildings classified as Group R-2 equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with *emergency escape and rescue openings* in accordance with Section 1031.

b. Group B, F and S occupancies in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or on an occupiable roof of such buildings shall have a maximum *exit access* travel distance of 100 feet.

c. This table is used for R-2 occupancies consisting of *sleeping units.* For R-2 occupancies consisting of *dwelling units*, use Table 1006.3.4(1).

d. The length of *exit access* travel distance in a Group S-2 *open parking garage* shall be not more than 100 feet.

1008.1 Means of egress illumination. Illumination shall be provided in the *means of egress* in accordance with Section 1008.2. ~~Under emergency power~~ In the event of power supply failure, *means of egress* illumination shall comply with Section 1008.3.

1008.2 Illumination required. The *means of egress* serving a room or space shall be illuminated at all times that the room or space is occupied.

Exceptions:

1. Occupancies in Group U.
2. Self-service storage units 400 ft (37.16 m) or less in area and accessed directly from the exterior of the building.
3. ~~2.~~ Aisle accessways in Group A.
4. ~~3.~~ *Dwelling units* and *sleeping units* in Groups R-1, R-2 and R-3.
5. ~~4.~~ *Sleeping units* of Group I occupancies.

1008.2.1 Illumination level under normal power. The *means of egress* illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. Along exit access stairways, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles (108 lux) at the walking surface when the stairway is in use.

Exception: For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances by one of the following methods provided that the required illumination is automatically restored upon activation of a premises' *fire alarm system*:

1. Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux).

2. Steps, landings and the sides of *ramps* shall be permitted to be marked with *self-luminous* materials in accordance with Sections 1025.2.1, 1025.2.2 and 1025.2.4 by systems *listed* in accordance with UL 1994.

~~**1008.3**~~ **1008.2.4** ~~**Emergency power**~~ **Power for illumination.** The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply.

~~**1008.3.1 General**. In the event of power supply failure in rooms and spaces that require two or more *exits* or access to exits, an emergency electrical system shall automatically illuminate all of the following areas:~~

~~1. Aisles.~~

~~2. Corridors.~~

~~3. Exit access stairways and ramps.~~

~~**1008.3.2 Buildings.** In the event of power supply failure in buildings that require two or more *exits* or access to exits, an emergency electrical system shall automatically illuminate all of the following areas:~~

~~1. Interior exit access stairways and ramps.~~

~~2. *Interior* and *exterior exit stairways* and *ramps*.~~

~~3. *Exit passageways*.~~

~~4. Vestibules and areas on the level of discharge used for *exit discharge* in accordance with Section 1028.2.~~

~~5. Exterior landings as required by Section 1010.1.5 for *exit doorways* that lead directly to the *exit discharge*.~~

~~**1008.3.3 Rooms and spaces.** In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:~~

~~1. Electrical equipment rooms.~~

~~2. Fire command centers.~~

~~3. Fire pump rooms.~~

~~4. Generator rooms.~~

~~5. Public restrooms with an area greater than 300 square feet (27.87 m^2).~~

1008.3 Illumination required by an emergency electrical system . An emergency electrical system shall be provided to automatically illuminate the following areas in the event of a power supply failure:

1. In rooms or spaces that require two or more exits or access to exits:
   1.1. Aisles.
   1.2. Corridors.
   1.3. Exit access stairways and ramps.
2. In buildings that require two or more exits or access to exits:
   2.1. Interior exit access stairways and ramps.
   2.2. Interior and exterior exit stairways and ramps.
   2.3. Exit passageways
   2.4. Vestibules and areas on the level of discharge used for exit discharge in accordance with Section 1028.2.
   2.5. Exterior landings as required by Section 1010.1.5 for exit doorways that lead directly to the exit discharge.
3. In other rooms and spaces:

3.1. Electrical equipment rooms.

3.2. Fire command centers.

3.3. Fire pump rooms.

3.4. Generator rooms.

3.5. Public restrooms with an area greater than 300 square feet (27.87 m²).

~~1008.3.4~~ 1008.3.1 **Duration.** The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

~~1008.3.5~~ 1008.3.2 **Illumination level under emergency power.** Emergency lighting facilities shall be arranged to provide initial illumination that is not less than an average of 1 footcandle (11 lux) and a minimum at any point of 0.1 footcandle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 footcandle (6 lux) average and a minimum at any point of 0.06 footcandle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded. In Group I-2 occupancies, failure of a single lamp in a luminaire shall not reduce the illumination level to less than 0.2 footcandle (2.2 lux).

Revise all instances of occupied with occupiable (occupiable ~~occupied~~) and unoccupied with unoccupiable (unoccupiable ~~unoccupied~~) in the title (as shown below) and/or body of the following sections:

1009.2.1 Elevators required…

1009.2.1 Elevators required. In buildings where a required accessible floor is four or more stories above or below a *level of exit discharge* or where an accessible occupiable roof is above a story that is three or more stories above the level of exit discharge, not less than one required *accessible means of egress* shall ~~be~~ include an elevator complying with Section 1009.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of the accessible means of egress on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required as part of an accessible means of egress on floors or occupiable roofs provided with a *ramp* conforming to the provisions of Section 1012.

1009.2.2 Doors. Where doors are part of an accessible route to provide access to an exit, area of refuge or exterior area of assisted rescue, maneuvering clearances shall be provided at such doors as required by ICC A117.1 in the direction of egress. Where doors lead to an area of refuge or exterior area for assisted rescue and re-entry to the floor is possible, maneuvering shall be provided on both sides of the door.

Exception: Maneuvering clearances are not required at the exit stairways for levels above and below the level of exit discharge where the exit enclosure does not include an area of refuge.

1009.6.2 Stairway or elevator access. Every required area of refuge shall have direct access to a stairway complying with Sections 1009.3 and 1023 or an elevator complying with Section 1009.4.

Exception: An interior area of refuge at the level of exit discharge that provides direct access to an exterior exit door.

1009.6.3 Size. Each area of refuge shall be sized to accommodate one wheelchair space of 30 inches by ~~48~~ 52 inches (762 mm by ~~1219~~ 1321 mm) for each 200 occupants or portion thereof, based on the occupant load of the area of refuge and areas served by the area of refuge. Such wheelchair spaces shall not reduce the means of egress minimum width or required capacity. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

1009.8.1 System requirements. Two-way communication systems shall provide communication between each required location and the *fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a *constantly attended location*, ~~a~~the two-way communication system shall have timed, automatic telephone dial-out capability ~~to a monitoring location~~ that provides two-way communication with an approved supervising station or emergency services ~~9-1-1~~. The two-way communication system shall include both audible and visible signals. Systems shall be listed in accordance with UL 2525 and installed in accordance with NFPA 72.

1009.11 Instructions. In *areas of refuge*, ~~and~~ exterior areas for assisted rescue, and locations required to provide two-way communications systems complying with Section 1009.8 instructions on the use of the area under emergency conditions shall be posted. Signage shall comply with the ICC A117.1 requirements for visual characters. The instructions shall include all of the following:

1. Persons able to use the *exit stairway* do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of *stairs* or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communication system where provided.

SECTION 1010 DOORS, GATES AND TURNSTILES

1010.1 Doors. ~~Means~~ Doors in the means of egress shall comply with the requirements of Sections 1010.1.1 through 1010.3.4. Exterior exit doors shall ~~meet~~ also comply with the requirements of ~~this section. Doors serving a~~ Section 1022.2. Gates in the means of egress shall comply with the requirements of Section 1010.4 through 1010.4.1. Turnstiles in the means of egress ~~system~~ shall ~~meet~~ comply with the requirements of ~~this section and Section 1022.2. Doors~~ Section 1010.5 through 1010.5.4.

Doors, gates and turnstiles provided for egress purposes in numbers greater than required by this code shall ~~meet~~ comply with the requirements of this section.

Doors in the ~~Means~~ means of egress ~~doors~~ shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.

1010.1.1 Size of doors. The required capacity of each door opening shall be sufficient for the *occupant load* thereof and shall provide a minimum clear opening width of 32 inches (813 mm). The clear opening width of doorways with swinging doors shall be measured between the face of the door and the frame stop, with the door open 90 degrees (1.57 rad). Where this section requires a minimum clear opening width of 32 inches (813 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a minimum clear opening width of 32 inches (813 mm). In Group I-2, doors serving as means of egress doors where used for the movement of beds shall provide a minimum clear opening width of $41^1/_2$ inches (1054 mm). ~~The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal.~~ The minimum clear opening height of doors shall be not less than 80 inches (2032 mm).

Exceptions:

1. In Group R-2 and R-3 *dwelling and sleeping units* that are not required to be an *Accessible unit*, *Type A unit* or *Type B unit*, the minimum width shall not apply to door openings that are not part of the required *means of egress*.
2. In Group I-3, door openings to resident *sleeping units* that are not required to be an *Accessible unit* shall have a minimum clear opening width of 28 inches (711 mm).
3. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum clear opening width.
4. ~~The maximum width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.~~
5. ~~The maximum width of door leaves in *power-operated doors* that comply with Section 1010.3.2 shall not be limited.~~
4. Door openings within a *dwelling unit* or *sleeping unit* shall have a minimum clear opening height of 78 inches (1981 mm).

5. In *dwelling and sleeping units* that are not required to be *Accessible*, Type A or *Type B units*, exterior door openings other than the required *exit* door shall have a minimum clear opening height of 76 inches (1930 mm).
6. In Groups I-1, R-2, R-3 and R-4, in *dwelling and sleeping units* that are not required to be Accessible, Type A or *Type B units*, the minimum clear opening widths shall not apply to interior egress doors.
7. Door openings required to be *accessible* within *Type B units* intended for user passage shall have a minimum clear opening width of 31.75 inches (806 mm).
8. ~~Doors to walk-in freezers and coolers less than 1,000 square feet (93 m^2) in area shall have a maximum width of 60 inches (1524 mm) nominal.~~
8. Doors serving sauna compartments, toilet compartments or dressing, fitting or changing compartments that are not required to be accessible shall have a minimum clear opening width of 20 inches (508 mm).
9. Door serving shower compartments shall comply with Section 421.4.2 of the International Plumbing Code.
10. ~~The minimum clear opening width shall not apply to doors for nonaccessible shower or sauna compartments~~.
11. ~~The minimum clear opening width shall not apply to the doors for nonaccessible toilet stalls~~.

1010.1.1.1 Projections into clear ~~width~~ opening. There shall not be projections into the required clear opening width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

> **Exception:** Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door ~~stops~~ locks shall be permitted to project into the door opening height not lower than ~~be~~ 78 inches (1980 mm) minimum above the floor.

1010.1.2 ~~Door Swing~~ Egress door types. Egress doors shall be of the ~~pivoted or~~ side-hinged swinging ~~type~~ door, pivoted door or balanced door types.

Exceptions:

1. *Private garages*, office areas, factory and storage areas with an *occupant load* of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single *dwelling unit* in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1010.3.1.
6. In other than Group H occupancies, special purpose horizontal sliding, accordion or folding door assemblies complying with Section 1010.3.3.
7. *Power-operated* doors in accordance with Section 1010.3.2.
8. Doors serving a bathroom within an individual *dwelling unit* or *sleeping unit* in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a *means of egress* from spaces with an *occupant load* of 10 or less.

1010.1.2.1 Direction of swing. (No change to text)

1010.1.3 ~~Door opening force~~ Forces to unlatch and open doors. ~~The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5 pounds (22 N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. For other swinging doors, as well as sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force.~~ The forces to unlatch doors shall comply with the following:

> 1.Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (66.7N).
>
> 2.Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (315 N-cm).

The forces to open doors shall comply with the following:

1.For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).

2.For other swinging doors, sliding doors, or folding doors, and doors required to be fire rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full-open position when subjected to not more than a 15-pound (67 N) force.

1010.1.3.1 Location of applied forces. (No change to text)

[BE] 1010.1.3.2 Manual horizontal sliding doors. Where a manual horizontal sliding door is required to latch, the latch or other mechanism shall prevent the door from rebounding into a partially open position when the door is closed.

~~**1010.1.5**~~**1010.1.4 Floor elevation.** There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

Exceptions:

1.~~Doors~~At doors serving individual dwelling units or sleeping units in Groups R-2 and R-3 ~~where the following apply:~~

~~1.1 A~~a door is permitted to open at the top step of an interior flight of stairs, provided that the door does not swing over the top step.

~~1.Screen doors and storm doors are permitted to swing over stairs or landings.~~

~~2.Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1022.2, which are not on an accessible route.~~

2.At exterior doors serving Groups F, H, R-2 and S and where such doors are not part of an accessible route, the landing at an exterior door shall not be more than 7 inches (178 mm) below the landing on the egress side of the door, provided the door, other than an exterior storm or screen door, does not swing over the landing.

3.~~In Group R-3 occupancies~~ At exterior doors serving Group U and individual dwelling units and sleeping units in Group R-2 and R-3, and where such units are not required to be Accessible units, Type A units or Type B units, the landing at an exterior doorway shall be not more than 7¾ inches (197 mm) below the landing on the ~~top~~ egress side of the ~~threshold, provided the door, other than an exterior~~ door. Such doors, including storm or screen door, ~~does not~~ shall be permitted to swing over ~~the~~ either landing.

4.Variations in elevation due to differences in finish materials, but not more than ½ inch (12.7 mm).

5.Exterior decks, patios or balconies that are part of Type B dwelling units or sleeping units, that have impervious surfaces and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the dwelling unit or sleeping unit.

6.Doors serving equipment spaces not required to be accessible in accordance with Section 1103.2.9 and serving an occupant load of five or less shall be permitted to have a landing on one side to be not more than 7 inches (178 mm) above or below the landing on the egress side of the door.

~~**[BE] 1010.1.4.4.1 Remote operation of locks.** Remote operation of locks complying with Section 1010.1.4.4 shall be permitted.~~

~~**1010.1.6**~~**1010.1.5 Landings at doors.** (No change to text)

~~**1010.1.7**~~**1010.1.6 Thresholds.** (No change to text)

~~**1010.1.8**~~**1010.1.7 Door arrangement.** (No change to text)

~~**1010.1.9**~~**1010.2 Door operations.** (No change to text)

~~**1010.1.9.6**~~**1010.2.1 Unlatching.** The unlatching of any door or ~~leaf shall not require more than one operation~~ leaf for egress shall require not more than one motion in a single linear or rotational direction to release all latching and all locking devices. *Manual bolts* are not permitted.

Exceptions:

1. Places of detention or restraint.

~~2. Where manually operated bolt locks are permitted by Section 1010.2.5.~~

~~3. Doors with *automatic flush bolts* as permitted by Section 1010.2.4, Item 4.~~

2. Doors with manual bolts, automatic flush bolts and constant latching bolts as permitted by Section 1010.2.4, Item 4.

3. Doors from individual *dwelling units* and *sleeping units* of Group R occupancies as permitted by Section 1010.2.4, Item 5.

~~**1010.1.9.1**~~**1010.2.2 Hardware.** (No change to text)

[NY] ~~**1010.1.9.2**~~**1010.2.3 Hardware height.** Door handles, pulls, latches, locks and other operating devices shall be installed 34 inches (864 mm) minimum and 48 inches (1219 mm) maximum above the finished floor. ~~Locks used only for security purposes and not used for normal operation are permitted at any height.~~

Exceptions: ~~**Exception:**~~

~~Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to have operable parts of the latch release on self-latching devices at 54 inches (1370 mm) maximum above the finished floor or ground, provided that the self-latching devices are not also self-locking devices operated by means of a key, electronic opener or integral combination lock.~~

1. Locks used only for security purposes and not used for normal operation are permitted at any height.
2. Door and gate locks and latches used in barriers which restrict access to a pool, spa, or hot tub shall comply with Sections 3109.3.2.7 and 3109.3.2.8 of the Building Code of New York State

~~**1010.1.9.4**~~**1010.2.4 Locks and latches.** Locks and latches shall be permitted to prevent operation of doors where any of the following exist:

1. Places of detention or restraint.
2. In Group I-1, Condition 2 and Group I-2 occupancies where the clinical needs of persons receiving care require containment or where persons receiving care pose a security threat, provided that all clinical staff can readily unlock doors at all times, and all such locks are keyed to keys carried by all clinical staff at all times or all clinical staff have the codes or other means necessary to operate the locks at all times.
3. In buildings in occupancy Group A having an *occupant load* of 300 or less, Groups B, F, M and S, and in *places of religious worship*, the main door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   3.1. The doors are the main exterior doors to the building, or the doors are the main doors to the tenant space.
   3.2. The locking device is readily distinguishable as locked.
   3.3. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.
   3.4. The use of the key-operated locking device is revocable by the *building official* for due cause.
4. ~~Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.~~ *Manual bolts*, *automatic flush bolts*, and *constant latching bolts* on the inactive leaf of a pair of doors in accordance with Table 1010.2.4, provided the inactive leaf does not have a doorknob, panic hardware, or similar operating hardware.
5. ~~Doors from~~ Single exit doors complying with Section 1006.2.1 or 1006.3.4 from individual dwelling or sleeping units of Group R occupancies ~~having an *occupant load* of 10 or less~~ permitted to have a single exit in accordance with and ~~are permitted to be~~ equipped with a night latch, *dead bolt*, *manual bolt*, or security chain, that requires a second releasing motion, provided such devices are openable from the inside without the use of a key or tool.
6. *Fire doors* after the minimum elevated temperature has disabled the unlatching mechanism in accordance with *listed fire door* test procedures.

7. Doors serving roofs not intended to be occupied shall be permitted to be locked preventing entry to the building from the roof.

8. Other than egress *courts*, where occupants must egress from an exterior space through the building for *means of egress*, exit access doors shall be permitted to be equipped with an approved locking device where installed and operated in accordance with all of the following:

8.1 The maximum *occupant load* shall be posted where required by Section 1004.9. Such sign shall be permanently affixed inside the building and shall be posted in a conspicuous space near all the exit access doorways.

8.2 A weatherproof telephone or two-way communication system installed in accordance with Sections 1009.8.1 and 1009.8.2 shall be located adjacent to not less than one required exit access door on the exterior side.

8.3 The egress door locking device is readily distinguishable as locked and shall be a key-operated locking device.

8.4 A clear window or glazed door opening, not less than 5 square feet (0.46 m^2) in area, shall be provided at each exit access door to determine if there are occupants using the outdoor area.

8.5 A readily visible, durable sign shall be posted on the interior side on or adjacent to each locked required exit access door serving the exterior area stating, "THIS DOOR TO REMAIN UNLOCKED WHEN THE OUTDOOR AREA IS OCCUPIED." The letters on the sign shall be not less than 1 inch (25.4 mm) high on a contrasting background.

8.6 The *occupant load* of the occupied exterior area shall not exceed 300 occupants in accordance with Section 1004.

9. Locking devices are permitted on doors to balconies, decks or other exterior spaces serving individual dwelling or sleeping units.

10. Locking devices are permitted on doors to balconies, decks or other exterior spaces of 250 square feet (23.23 m^2) or less serving a private office space.

TABLE 1010.2.4

MANUAL BOLTS, AUTOMATIC FLUSH BOLTS AND CONSTANT LATCHING BOLTS ON THE INACTIVE LEAF OF A PAIR OF DOORS

APPLICATION WITH A PAIR OF DOORS WITH AN ACTIVE LEAF AND INACTIVE LEAF	THE PAIR OF DOORS ARE REQUIRED TO COMPLY WITH SECTION 716	PERMITTED USES OF MANUAL BOLTS, AUTOMATIC FLUSH BOLTS, AND CONSTANT LATCHING BOLTS ON THE INACTIVE LEAF OF A PAIR OF DOORS.		
		Surface or flush mounted manual bolts	Automatic flush bolts	Constant latching bolts
Group B, F, or S occupancies with occupant load less than 50.	No	P	P	P
	Yes	NP	NP[b]	P
Group B,F, or S occupancies where the building is equipped with automatic sprinkler system in accordance with Section 903.3.1.1 and the inactive leaf is not needed to meet egress capacity requirements.	No	P	P	P
	Yes	NP	NP[b]	P
	No	NP	NP[b]	P

Group I-2 patient care and sleeping rooms where inactive leaf is not needed to meet egress capacity requirements.	Yes	NP	NP[b]	P
Any ooccupancy where panic hardware is not required, egress doors are used in pairs, and where both leafs are required to meet egress capacity requirements.	No	NP	P	NP
	Yes	NP	NP[b]	NP
Storage or equipment rooms where the inactive leaf is not needed to meet egress capacity requirements.	No	P[a]	P	P
	Yes	P[a]	P	P

P - Permitted; NP - Not permitted.

a. Not permitted on corridor doors in Group I-2 occupancies where corridor doors are required to be positive latching.

b. Permitted where both doors are self-closing or automatic-closing, and are provided with a coordinator that causes the inactive leaf to be closed prior to the active leaf.

~~**1010.1.9.5 Bolt locks.**~~ **(Delete entire section)**

~~**1010.1.9.6.1**~~**1010.2.5 Closet doors.**

~~**1010.1.9.12**~~**1010.2.6 Stairway doors.** Interior *stairway* means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. *Stairway* discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3 of the International Building Code.
3. *Stairway* exit doors ~~are permitted to~~ shall not be locked from the side opposite the egress side, ~~provided that~~ unless they are openable from the egress side and capable of being unlocked simultaneously without unlatching by any of the following:
   3.1. Shall be capable of being unlocked individually or simultaneously upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.
   3.2. Shall unlock simultaneously upon activation of a fire alarm signal when a fire alarm system is present in an area served by the stairway.
   3.3. Shal unlock upon failure of the power supply to the electric lock or the locking system.
4. *Stairway exit* doors shall be openable from the egress side and shall only be locked from the opposite side in Group B, F, M and S occupancies where the only interior access to the tenant space is from a single *exit stairway* where permitted in Section 1006.3.4.
5. *Stairway* exit doors shall be openable from the egress side and shall only be locked from the opposite side in Group R-2 occupancies where the only interior access to the *dwelling unit* is from a single exit *stairway* where permitted in Section 1006.3.4.

~~**1010.1.4.4**~~**1010.2.7 Locking arrangements in educational occupancies.** In Group E and Group B educational occupancies, egress doors from classrooms, offices and other occupied rooms shall be permitted to be provided with locking arrangements designed to keep intruders from entering the room where all of the following conditions are met:

1.The door shall be capable of being unlocked from outside the room with a key or other approved means.

2.The door shall be openable from within the room in accordance with Section 1010.~~1.9~~2.

3.Modifications shall not be made to listed panic hardware, fire door hardware or door closers.

4. Modifications to fire door assemblies shall be in accordance with NFPA 80.

Remote locking or unlocking of doors from an approved location shall be permitted in addition to the unlocking operation in Item 1.

~~1010.1.10~~ 1010.2.8 **Panic and fire exit hardware.** Swinging doors serving a Group H occupancy and swinging doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock other than panic hardware or fire exit hardware.

Exceptions:

1. A main exit of a Group A occupancy shall be permitted to have locking devices in accordance with Section ~~1010.1.9.4~~ 1010.2.4, Item ~~2~~3.
2. Doors provided with *panic hardware* or *fire exit hardware* and serving a Group A or E occupancy shall be permitted to be electrically locked in accordance with Section ~~1010.1.9.9~~ 1010.2.11 ~~or 1010.1.9.10~~.
3. Exit access doors serving occupied exterior areas shall be permitted to be locked in accordance with Section 1010.2.4, Item 8.
4. Courtrooms shall be permitted to be locked in accordance with Section 1010.2.13, Item 3.

~~Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide, and that contain overcurrent devices, switching devices or control devices with exit or exit access doors, shall be equipped with panic hardware or fire exit hardware. The doors shall swing in the direction of egress travel.~~

Refrigeration machinery rooms larger than 1,000 square feet (93 m2) shall have not less than two exits or exit access doorways that swing in the direction of egress travel and are equipped with panic hardware or fire exit hardware.

1010.2.8.1 Refrigeration machinery room. Refrigeration machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two exit or exit access doorways that swing in the direction of egress travel and shall be equipped with panic hardware or fire exit hardware.

1010.2.8.2 Rooms with electrical equipment. Exit or exit access doors serving transformer vaults, rooms designated for batteries or energy storage systems, or modular data centers shall be equipped with panic hardware or fire exit hardware. Rooms containing electrical equipment rated 800 amperes or more that contain overcurrent devices, switching devices or control devices and where the exit or exit access door is less than 25 feet (7620 mm) from the equipment working space as required by NFPA 70, such doors shall not be provided with a latch or lock other than panic hardware or fire exit hardware. The doors shall swing in the direction of egress travel.

~~1010.1.10.1~~1010.2.8.3 **Installation.** (No change to text)

~~1010.1.10.2~~1010.2.8.4 **Balanced doors.** (No change to text)

~~1010.1.9.3~~1010.2.9 **Monitored or recorded egress, and access control systems.** Where electrical systems that monitor or record egress activity are incorporated, or where the door has an access control system, the locking system on the egress side of the door shall comply with Section ~~1010.1.9.7, 1010.1.9.8, 1010.1.9.9, 1010.1.9.10 or 1010.1.9.11~~ 1010.2.10, 1010.2.11, 1010.2.12, 1010.2.13 or 1010.2.14 or shall be readily openable from the egress side without the use of a key or special knowledge or effort.

~~1010.1.9.10~~1010.2.10 **Door hardware release of electrically locked egress doors.** Door hardware release of ~~electric~~ electrical locking systems shall be permitted on doors in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following:

1. The door hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The door hardware is capable of being operated with one hand and shall comply with Section ~~1010.1.9.6~~ 1010.2.1.

3. Operation of the door hardware directly interrupts the power to the electric lock and unlocks the door immediately.
4. Loss of power to the electrical locking system automatically unlocks the ~~door~~ electric lock.
5. Where *panic* or *fire exit hardware* is required by Section ~~1010.1.10~~ 1010.2.8, operation of the *panic* or *fire exit hardware* also releases the electric lock.
6. The ~~locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

~~**1010.1.9.9**~~**1010.2.11 Sensor release of electrically locked egress doors.** Sensor release of ~~electric~~ electrical locking systems shall be permitted on doors located in the *means of egress* in any occupancy except Group H where installed and operated in accordance with all of the following criteria:

1. The sensor shall be installed on the egress side, arranged to detect an occupant approaching the doors, and shall cause the electrical locking system to unlock the electric lock.
2. ~~The electric locks shall be arranged to unlock by a signal from or loss of power to the sensor.~~ Upon a signal from a sensor or loss of power to the sensor, the electrical locking system shall unlock the electric lock.
3. Loss of power to the electric lock or electrical locking system shall automatically unlock the electric locks.
4. The doors shall be arranged to unlock the electric lock from a manual unlocking device located 40 inches to 48 inches (1016 mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the electric lock—independent of other electronics—and the electric lock shall remain unlocked for not less than 30 seconds.
5. Activation of the building *fire alarm system*, where provided, shall automatically unlock the electric lock, and the electric lock shall remain unlocked until the *fire alarm system* has been reset.
6. Activation of the building *automatic sprinkler system* or fire detection system, where provided, shall automatically unlock the electric lock. The electric lock shall remain unlocked until the *fire alarm system* has been reset.
7. Emergency lighting shall be provided on the egress side of the door.
8. The door ~~locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

~~**1010.1.9.8**~~**1010.2.12 Delayed egress.** Delayed egress electrical locking systems shall be permitted ~~to be installed~~ on doors in the means of egress serving the following occupancies in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke* or *heat detection system* installed in accordance with Section 907.

1. Group B, F, I, M, R, S and U occupancies.
2. Group E classrooms with an *occupant load* of less than 50.
3. ~~**Exception:** Delayed~~ In courtrooms in Group A-3 and B occupancies, delayed egress electrical locking systems shall be permitted to be installed on exit or *exit access* doors, other than the main exit or *exit access* door, ~~serving a courtroom~~ in buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~**1010.1.9.8.1**~~**1010.2.12.1 Delayed egress locking system.** The delayed egress electrical locking system shall be installed and operated in accordance with all of the following:

1. The delay ~~electronics~~ of the delayed egress electrical locking system shall deactivate upon actuation of the *automatic sprinkler system* or *automatic fire detection system*, allowing immediate free egress.

2. The delay ~~electronics~~ of the delayed egress electrical locking system shall deactivate upon loss of power ~~controlling~~ to the ~~lock~~ electrical locking system or electric lock ~~mechanism~~, allowing immediate free egress.
3. The delay of the delayed egress electrical locking system shall have the capability of being deactivated at the *fire command center* and other *approved* locations.
4. An attempt to egress shall initiate an irreversible process that shall allow such egress in not more than 15 seconds when a physical effort to exit is applied to the egress side door hardware for not more than 3 seconds. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the delay ~~electronics have~~ has been deactivated, rearming the delay electronics shall be by manual means only.

   Exception: Where *approved*, a delay of not more than 30 seconds is permitted on a delayed egress door.
5. The egress path from any point shall not pass through more than one delayed egress locking system.

   Exceptions:

   1. In Group I-1, Condition 2, Group I-2 or I-3 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided that the combined delay does not exceed 30 seconds.
   2. In Group I-1, Condition 1 or Group I-4 occupancies, the egress path from any point in the building shall pass through not more than two delayed egress locking systems provided the combined delay does not exceed 30 seconds and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
6. A sign shall be provided on the door and shall be located above and within 12 inches (305 mm) of the door exit hardware.

   Exception: Where approved, in Group I occupancies, the installation of a sign is not required where care recipients who because of clinical needs require restraint or containment as part of the function of the treatment area.

   6.1. For doors that swing in the direction of egress, the sign shall read, "PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.2. For doors that swing in the opposite direction of egress, the sign shall read, "PULL UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 [30] SECONDS."

   6.3. The sign shall comply with the visual character requirements in ICC A117.1.
7. Emergency lighting shall be provided on the egress side of the door.
8. The ~~delayed egress locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

~~1010.1.9.7~~**1010.2.13 Controlled egress doors in Groups I-1 and I-2.** ~~Electric~~ Controlled egress electrical locking systems, ~~including electro-mechanical locking systems and electromagnetic locking systems,~~ where egress is controlled by authorized personnel, shall be permitted ~~to be locked~~ on doors in the *means of egress* in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved automatic smoke detection system* installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following:

1. The door's electric locks shall unlock on actuation of the *automatic sprinkler system* or *automatic ~~fire~~ smoke detection system*, allowing immediate free egress.
2. The door's electric locks shall unlock on loss of power ~~controlling~~ to the ~~lock~~ electrical locking system or to the electric lock ~~mechanism~~, allowing immediate free egress.
3. The ~~door~~ electrical locking system shall be installed to have the capability of ~~being unlocked~~ unlocking the electric locks by a switch located at the *fire command center*, a nursing station or other *approved* location. The switch shall directly break power to the electric lock.

4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an *exit*.
5. The procedures for unlocking the doors shall be described and *approved* as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
6. All clinical staff shall have the keys, codes or other means necessary to operate the controlled egress electrical locking systems.
7. Emergency lighting shall be provided at the door.
8. The door ~~locking system units~~ electro-mechanical or electromagnetic locking device shall be *listed* in accordance with either UL 294 or UL 1034.

Exceptions:

1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.
2. Items 1 through 4 shall not apply to doors to areas where a *listed* egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 *hospital*.

1010.2.14 Elevator lobby exit access doors. Electrically locked exit access doors providing egress from elevator lobbies shall be permitted where all the following conditions are met:

1. For all occupants of the floor, the path of exit access travel to not less than two exits is not required to pass through the elevator lobby.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and a fire alarm system in accordance with Section 907. Elevator lobbies shall be provided with an automatic smoke detection system in accordance with Section 907.
3. Activation of the building fire alarm system by other than a manual fire alarm box shall automatically unlock the electric lock locks providing exit access from the elevator lobby lobbies, and the electric lock locks shall remain unlocked until the fire alarm system is reset.
4. The electric locks shall unlock on loss of power to the electric lock or electrical locking system.
5. The electric locks shall have the capability of being unlocked by a switch located at the fire command center, security station, or other approved location.
6. A two-way communication system complying with Sections 1009.8.1 and 1009.8.2, shall be located in the elevator lobby adjacent to the electrically locked exit access door and connected to an approved constantly attended station. This constantly attended station shall have the capability of unlocking the electric locks of the elevator lobby exit access doors.
7. Emergency lighting shall be provided in the elevator lobby on both sides of the electrically locked door.
8. The door locking system units shall be listed in accordance with either UL 294 or UL 1034.

~~1010.1.9.11~~ **1010.2.15 Locking arrangements in buildings within correctional facilities.** (No change to text)

~~1010.1.4~~**1010.3 Special doors.** (No change to text)

~~1010.1.4.1~~**1010.3.1 Revolving doors.** Revolving doors shall comply with the following:

1. Revolving doors shall comply with BHMA A156.27 and shall be installed in accordance with the manufacturer's instructions.
2. Each revolving door shall be capable of breakout in accordance with BHMA A156.27 and shall provide an aggregate width of not less than 36 inches (914 mm).
3. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of stairways or escalators. A dispersal area shall be provided between the stairways or escalators and the revolving doors.

4. The revolutions per minute (rpm) for a revolving door shall not exceed the maximum rpm as specified in BHMA A156.27. Manual revolving doors shall comply with ~~Table 1010.1.4.1(1)~~Table 1010.3.1(1). Automatic or power-operated revolving doors shall comply with ~~Table 1010.1.4.1(2)~~ Table 1010.3.1.(2).
5. An emergency stop switch shall be provided near each entry point of power or automatic operated revolving doors within 48 inches (1220 mm) of the door and between ~~24~~34 inches (~~610~~864 mm) and 48 inches (1220 mm) above the floor. The activation area of the emergency stop switch button shall be not less than 1 inch (25 mm) in diameter and shall be red.
6. Each revolving door shall have a side-hinged swinging door that complies with Section 1010.1 in the same wall and within 10 feet (3048 mm) of the revolving door.
7. Revolving doors shall not be part of an accessible route required by Section 1009 and Chapter 11.

TABLE ~~1010.1.4.1(1)~~ 1010.3.1(1)

MAXIMUM DOOR SPEED MANUAL REVOLVING DOORS

REVOLVING DOOR MAXIMUM NOMINAL DIAMETER (FT-IN)	MAXIMUM ALLOWABLE REVOLVING DOOR SPEED (RPM)
6-0	12
7-0	11
8-0	10
9-0	9
10-0	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

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TABLE ~~1010.1.4.1~~ 1010.3.1(2)

MAXIMUM DOOR SPEED AUTOMATIC OR POWER-OPERATED REVOLVING DOORS

REVOLVING DOOR MAXIMUM NOMINAL DIAMETER (FT-IN)	MAXIMUM ALLOWABLE REVOLVING DOOR SPEED (RPM)
8-0	7.2
9-0	6.4
10-0	5.7
11-0	5.2
12-0	4.8

12-6	4.6
14-0	4.1
16-0	3.6
17-0	3.4
18-0	3.2
20-0	2.9
24-0	2.4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

~~1010.1.4.1.1~~1010.3.1.1 **Egress component.** (No change to text)

~~1010.1.4.1.2~~1010.3.1.2 **Other than egress component.** (No change to text)

~~1010.1.4.2~~1010.3.2 **Power-operated doors.** (No change to text)

~~1010.1.4.3~~1010.3.3 **Special purpose horizontal sliding, accordion or folding doors.** In other than Group H occupancies, special purpose horizontal sliding, accordion or folding door assemblies permitted to be a component of a means of egress in accordance with Exception 6 to Section 1010.1.2 shall comply with all of the following criteria:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method ~~from both sides~~ without special knowledge ~~or effort~~ or effort from the egress side or sides.
3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable fire protection rating and, where rated, shall be self-closing or automatic closing by smoke detection in accordance with Section 716.2.6.6, shall be installed in accordance with NFPA 80 and shall comply with Section 716.
6. The door assembly shall have an integrated standby power supply.
7. The door assembly power supply shall be electrically supervised.
8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.

~~1010.1.4.5~~1010.3.4 **Security grilles.** In Groups B, F, M and S, horizontal sliding or vertical security grilles are permitted at the main exit and shall be openable from the inside without the use of a key or special knowledge or effort during periods that the space is occupied. The grilles shall remain secured in the full-open position during the period of occupancy by the general public. Where two or more ~~means of egress~~ exits or access to exits are required, not more than one-half of the exits or exit access doorways shall be equipped with horizontal sliding or vertical security grilles.

~~1010.2~~1010.4 Gates serving the *means of egress* system shall comply with the requirements of this section. Gates used as a component in a *means of egress* shall conform to the applicable requirements for doors.

~~**Exception:** Horizontal sliding or swinging gates exceeding the 4-foot (1219 mm) maximum leaf width limitation are permitted in fences and walls surrounding a stadium.~~

~~1010.2.1~~1010.4.1 **Stadiums.** (No change to text)

~~1010.3~~1010.5 **Turnstiles and similar devices.** (No change to text)

~~1010.3.1~~1010.5.1 **Capacity. (No change to text)**

~~1010.3.1.1~~ 1010.5.1.1 **Clear width.** (No change to text)

[BE] ~~1010.3.2~~ 1010.5.2 **Security access turnstiles.** Security access turnstiles that inhibit travel in the direction of egress utilizing a physical barrier shall be permitted to be considered as a component of the means of egress, provided that all of the following criteria are met:

1.The building is protected throughout by an approved, supervised automatic sprinkler system in accordance with Section 903.3.1.1.

2.Each security access turnstile lane configuration has a minimum clear passage width of 22 inches (559 mm).

3.Any security access turnstile lane configuration providing a clear passage width of less than 32 inches (810 mm) shall be credited with a maximum egress capacity of 50 persons.

4.Any security access turnstile lane configuration providing a clear passage width of 32 inches (810 mm) or more shall be credited with a maximum egress capacity as calculated in accordance with Section 1005.

5.Each secured physical barrier shall automatically retract or swing to an unobstructed open position in the direction of egress, under each of the following conditions:

5.1.Upon loss of power to the turnstile or any part of the access control system that secures the physical barrier.

5.2.Upon actuation of a clearly identified manual release device with ready access that results in direct interruption of power to each secured physical barrier, after which such barriers remain in the open position for not less than 30 seconds. The manual release device shall be positioned at one of the following locations:

5.2.1.On the egress side of each security access turnstile lane.

5.2.2.At an approved location where it can be actuated by an employee assigned to the area at all times that the building is occupied.

5.3.Upon actuation of the building fire alarm system, if provided, after which the physical barrier remains in the open position until the fire alarm system is manually reset.

Exception: Actuation of a manual fire alarm box.

5.4.Upon actuation of the building automatic sprinkler or fire detection system, after which the physical barrier remains in the open position until the fire alarm system is manually reset.

~~1010.3.3~~1010.5.3 **High turnstile.** (No change to text)

~~1010.3.4~~1010.5.4 **Additional door.** (No change to text)

1011.2 Width and capacity. The required capacity of *stairways* shall be determined as specified in Section 1005.1, but the minimum width shall be not less than 44 inches (1118 mm). ~~See Section 1009.3 for *accessible means of egress stairways.*~~ The minimum width for stairways that serve as part of the accessible means of egress shall comply with Section 1009.3.

Exceptions:

1. *Stairways* serving an *occupant load* of less than 50 shall have a width of not less than 36 inches (914 mm).
2. *Spiral stairways* as provided for in Section 1011.10.
3. Where an incline platform lift or *stairway* chairlift is installed on *stairways* serving occupancies in Group R-3, or within *dwelling units* in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. Where the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

1011.3 Headroom. *Stairways* shall have a headroom clearance of not less than 80 inches (2032 mm) measured vertically from a line connecting ~~the edge of~~ the *nosings*. Such headroom shall be continuous above the *stairway* to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the *stairway* and landing.

Exceptions:

1. *Spiral stairways* complying with Section 1011.10 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual *dwelling units* in Group R-2 occupancies; where the *nosings* of treads at the side of a *flight* extend under the edge of a floor opening through which the *stair* passes, the floor opening shall be allowed to project horizontally into the required headroom not more than $4^3/_4$ inches (121 mm).

1011.5.2 Riser height and tread depth. *Stair* riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the *nosings* of adjacent treads or between the stairway landing and the adjacent tread. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's *nosing*. *Winder* treads shall have a minimum tread depth of 11 inches (279 mm) between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. *Spiral stairways* in accordance with Section 1011.10.
2. *Stairways* connecting stepped *aisles* to cross *aisles* or concourses shall be permitted to use the riser/tread dimension in Section 1030.14.2.
3. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies not required by Chapter 11 to be Accessible or Type A dwelling or sleeping units; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual *dwelling units* in Group R-2 occupancies; the maximum riser height shall be $7^3/_4$ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum *winder* tread depth at the walkline shall be 10 inches (254 mm); and the minimum *winder* tread depth shall be 6 inches (152 mm). A *nosing* projection not less than $^3/_4$ inch (19.1 mm) but not more than $1^1/_4$ inches (32 mm) shall be provided on *stairways* with solid risers where the tread depth is less than 11 inches (279 mm).
4. See Section 503.1 of the International Existing Building Code for the replacement of existing *stairways*.
5. In Group I-3 facilities, *stairways* providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

[BE]1011.5.4.1 Nonuniform height risers. Where the bottom or top riser adjoins a sloping *public way*, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of *stair* width. The *nosings* ~~or~~ ~~leading edges of treads~~ at such nonuniform height risers shall have a distinctive marking stripe, different from any other *nosing* marking provided on the *stair flight*. The distinctive marking stripe shall be visible in descent of the *stair* ~~and shall have a slip-resistant surface~~. Marking stripes shall have a width of not less than 1 inch (25 mm) but not more than 2 inches (51 mm).

[BE]1011.5.5.1 Nosing projection size. The ~~leading edge (*nosings*) of treads~~ nosings shall project not more than $1^1/_4$ inches (32 mm) beyond the tread below.

[BE]1011.5.5.2 Nosing projection uniformity. *Nosing* projections ~~of the leading edges~~ shall be of uniform size, including the projections of the ~~*nosing's* leading edge~~ nosings of the floor or landing at the top of a *flight*.

Exception: When solid risers are not required, the nosing projection is permitted to exceed the maximum projection.

[BE]1011.6 Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings, measured perpendicularly to the direction of travel, shall be not less than the width of stairways served. Every landing shall have a minimum depth, measured parallel to the direction of travel, equal to the width of the stairway or 48 inches (1219 mm), whichever is less. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into the required width of a landing. Where wheelchair spaces are required on the stairway landing in accordance with Section 1009.6.3, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

~~Exception~~Exceptions:

1.Where stairways connect stepped aisles to cross aisles or concourses, stairway landings are not required at the transition between stairways and stepped aisles constructed in accordance with Section 1029.

2. Where curved stairways of constant radius have intermediate landings, the landing depth shall be measured horizontally between the intersection of the walkline of the lower flight at the landing nosingand the intersection of the walkline of the upper flight at the nosing of the lowest tread of the upper flight.

3. Where a landing turns 90 degrees (1.57 rad) or more, the minimum landing depth in accordance with this section shall not be required where the corner of the landing on the outside of the turn in plan has been truncated and the area of the landing provided is not less than that described by an arc with a radius equal to the width of the flight served.

[BE]1011.7 Stairway construction. *Stairways* shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood *handrails shall be permitted for all types of construction*.

Exceptions:

1.Wood handrails shall be permitted in all types of construction.

2.Interior exit stairway in accordance with Section 510.2

[BE]1011.11 Handrails. *Flights of stairways* shall have *handrails* on each side and shall comply with Section 1014. Where glass is used to provide the *handrail*, the *handrail* shall comply with Section 2407.

Exceptions:

1.Flights of stairways within dwelling units and flights of spiral stairways are permitted to have a handrail on one side only.

2.Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.

3.In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.

4.Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

5. Where a platform lift is in a stationary position and the floor of the platform lift serves as the upper landing of a stairway, handrails shall not be required on the stairway, provided that all of the following criteria are met:

5.1. The stairway contains no more than two risers.

5.2. A handhold, positioned horizontally or vertically, is located on one side of the stairway adjacent to the top landing.

5.3. The handhold is located not less than 34 inches (864 mm) and not more than 42 inches (1066 mm) above the bottom landing of the stairway.

5.4. The handhold gripping surface complies with Section 1014.3, and is not less than 4.5 inches (144 mm) in length.

Revise all instances of occupied with occupiable (occupiable ~~occupied~~) and unoccupied with unoccupiable (unoccupiable ~~unoccupied~~) in the title (as shown below) and/or body of the following sections:

[BE]1011.12 Stairway to roof…

[BE]1011.12.2 Roof access…

[BE]1011.14 Alternating tread devices….

[BE]1011.15 Ships ladders. Ships ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupiable ~~unoccupied~~ roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ships ladders shall be designed for the live loads indicated in Section 1607.10 of the International Building Code

[BE]1011.16 Ladders. Permanent ladders shall not serve as a part of the *means of egress* from occupiable ~~occupied~~ spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code and designed for the live loads indicated in Section 1607.10 of the International Building Code. Permanent ladders shall be permitted to provide access to the following areas:

1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment.
2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways.
3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands.
4. Elevated levels in Group U not open to the general public.
5. ~~Nonoccupied~~ Nonoccupiable ~~-~~roofs that are not required to have *stairway* access in accordance with Section 1011.12.1.
6. Where permitted to access equipment and appliances in accordance with Section 306.5 of the International Mechanical Code.

[BE]1013.2 Low-level exit signs in Group R-1. Where exit signs are required in Group R-1 occupancies by Section 1013.1, additional low-level exit signs shall be provided in all areas serving guest rooms in Group R-1 occupancies and shall comply with Section 1013.5.

The bottom of the sign shall be not less than 10 inches (254 mm) nor more than 18 inches (455 mm) above the floor level. The sign shall be flush mounted to the door or wall. Where mounted on the wall, the edge of the sign shall be within 4 inches (102 mm) of the door frame on the latch side.

Exception: Low-level exit signs are not required in Group R-1 occupancies when the building is equipped throughout with an automatic sprinkler system installed in accordance with Sections 903.3.1.1 or 903.3.1.2

[BE]1013.4 Raised character and braille exit signs. ~~A sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 shall be provided adjacent to each door to~~ Where exit signs are provided at an area of refuge~~, providing~~ with direct access to a stairway, an exterior area for assisted rescue, an exit stairway or ramp, an exit passageway a horizontal exit and the exit discharge, a sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 shall be provided.

1013.5.1 Photoluminescent exit signs. Photoluminescent exit signs shall be provided with an illumination source to charge the exit sign in accordance with the manufacturer's instructions.

[NY] 1013.7 Pictograms. Exit signs may include a pictogram complying with NFPA 170. The exit symbol shall be not less than 4 inches (102 mm) in height.

1014.2 Height. *Handrail* height, measured from a line connecting ~~above stair tread~~ the *nosings* of flights of stairs or finish surface of *ramp* slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). *Handrail* height of *alternating tread devices* and ships ladders, measured from a line connecting ~~above tread~~ the *nosings*, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Exceptions:

1. Where *handrail* fittings or bendings are used to provide continuous transition between flights, the fittings or bendings shall be permitted to exceed the maximum height.

2. In Group R-3 occupancies; within *dwelling units* in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual *dwelling units* in Group R-2 occupancies; where *handrail* fittings or bendings are used to provide continuous transition between flights, transition at *winder* treads, transition from *handrail* to guard, or where used at the start of a *flight*, the *handrail* height at the fittings or bendings shall be permitted to exceed the maximum height.
3. *Handrails* on top of a *guard* where permitted along stepped *aisles* and ramped *aisles* in accordance with Section 1030.16.

1014.3 Lateral location. Handrails located outward from the edge of the walking surface of flights of stairways, ramps, stepped aisles and ramped aisles shall be located within 6 inches (152.4 mm) measured horizontally from the edge of the walking surface. Handrails projecting into the width of the walking surface shall comply with Section 1014.9.

~~1014.4~~ **1014.5 Continuity.** *Handrail* gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. ~~*Handrails* w~~ Within a *dwelling unit*~~s, are permitted~~, that is not an Accessible unit or Type A unit, the continuity of handrail gripping surfaces is allowed to be interrupted by a newel post at a turn or landing.
2. Within a *dwelling unit*, the use of a volute, turnout, starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the *handrail* that do not project horizontally beyond the sides of the *handrail* within $1^1/_2$ inches (38 mm) of the bottom of the *handrail* shall not be considered obstructions. For each $^1/_2$ inch (12.7 mm) of additional *handrail* perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of $1^1/_2$ inches (38 mm) shall be permitted to be reduced by $^1/_8$ inch (3.2 mm).
4. Where *handrails* are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the *handrail* gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper *guards*.
5. *Handrails* serving stepped *aisles* or ramped *aisles* are permitted to be discontinuous in accordance with Section 1030.16.1.

~~1014.6~~ **1014.7 Handrail extensions.** *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent *flight of stairs* or *ramp* run. Where *handrails* are not continuous between flights, the *handrails* shall extend horizontally not less than 12 inches (305 mm) beyond the top ~~riser~~ landing nosing and continue to slope for the depth of one tread beyond the bottom ~~riser~~ tread nosing. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the flights of *stairs* at *stairways* and the *ramp* runs at *ramps* and shall extend the required minimum length before any change in direction or decrease in the clearance required by Section 1014.5 or 1014.8.

Exceptions:

1. *Handrails* within a *dwelling unit* that is not required to be *accessible* need extend only from the top riser to the bottom riser.
2. *Handrails* serving *aisles* in rooms or spaces used for assembly purposes are permitted to comply with the *handrail* extensions in accordance with Section 1030.16.
3. *Handrails* for *alternating tread devices* and ships ladders are permitted to terminate at a location vertically above the top and bottom risers. *Handrails* for *alternating tread devices* are not required to be continuous between flights or to extend beyond the top or bottom risers.

1014.7 Clearance. Clear space between a *handrail* and a wall or other surface shall be not less than $1^1/_2$ inches (38 mm). A *handrail* and a wall or other surface adjacent to the *handrail* shall be free of any sharp or abrasive elements.

Exceptions:

1. A decrease in the clearance due to the curvature or angle of handrail returns shall be allowed.

2. Mounting flanges, no more than 1/2" (12.7 mm) thick at the returned ends of handrails shall be allowed.

1015.2 Where required. *Guards* shall be located along open-sided walking surfaces, ~~including~~ such as *mezzanines*, equipment platforms, *aisles*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side~~.~~, and at the perimeter of occupiable roofs. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.9.

Exceptions: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of *stages* and raised *platforms*, including *stairs* leading up to the *stage* and raised *platforms*.
3. On raised *stage* and *platform* floor areas, such as runways, *ramps* and side *stages* used for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating areas at cross *aisles* in accordance with Section 1030.17.2.
8. On the loading side of station platforms on fixed guideway transit or passenger rail systems.
9. Portions of an occupiable roof located less than 30 inches measured vertically to adjacent unoccupiable roof areas where approved guards are present at the perimeter of the roof.
10. At portions of an occupiable roof where an *approved* barrier is provided.

[BE]1015.3 Height. Required *guards* shall be not less than 42 inches (1067 mm) high, measured vertically as follows:

1. From the adjacent walking surfaces.
2. On *stairways* and stepped *aisles*, from the line connecting the l~~eading edges of the tread~~ *nosings*.
3. On *ramps* and ramped *aisles*, from the *ramp* surface at the guard.

Exceptions:

1. For occupancies in Group R-3 not more than three stories above grade in height and within individual *dwelling units* in occupancies in Group R-2 not more than three stories above grade in height with separate *means of egress*, required *guards* shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces.
2. For occupancies in Groups R-2 and R-3, within the interior conditioned space of individual dwelling units, where the open-sided walking surface is located not more than 25 feet (7.62 meters) measured vertically to the floor or walking surface below, required guards shall not be less than 36 inches (914 mm) in height measured vertically above the adjacent walking surface.
3. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.
4. For occupancies in Group R-3, and within individual *dwelling units* in occupancies in Group R-2, where the top of the *guard* serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.
5. The *guard* height in assembly seating areas shall comply with Section 1030.17 as applicable.
6. Along *alternating tread devices* and ships ladders, *guards* where the top rail serves as a *handrail* shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from a line connecting the leading edge of the treads ~~device tread nosing~~.

7. In Group F occupancies where *exit access stairways* serve fewer than three stories and such *stairways* are not open to the public, and where the top of the *guard* also serves as a *handrail*, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the nosings ~~leading edges of the treads~~.

1015.7 Roof access. Guards shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall extend not less than 30 inches (762mm) beyond each end of ~~such components~~ the hatch parallel to the roof edge. The guard shall be constructed so as to prevent the passage of a sphere 21 inches (533 mm) in diameter.

Exception: Guards are not required where personal fall arrest anchorage connector devices that comply with ANSI/ASSE Z 359.1 are installed.

1015.8 Window openings. Windows in Group R-2 and R-3 buildings including *dwelling units*, where the ~~top of the sill~~ bottom of the clear opening of an operable window is located less than 36 inches (914 mm) above the finished floor and more than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, shall comply with ~~one of~~ the following:

1. Where the bottom of the clear opening of the window is located more than 72 inches (1829 mm) and less than 75 feet (22 860 mm) above the finished grade or other surface below on the exterior of the building, the window shall comply with one of the following:

   ~~1.1 Operable windows where the top of the sill of the opening is located more than 75 feet (22 860 mm) above the finished grade or other surface below and that are provided with window fall prevention devices that comply with ASTM F2006.~~

   1.1. Operable windows where the openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position, provided the opening is not required for emergency escape or rescue.

   1.2. Operable windows where the openings are provided with window fall prevention devices that comply with ASTM F2090.

   1.3. Operable windows where the openings ~~that~~ are provided with window opening control devices that comply with ~~Section 1015.8.1~~ ASTM F2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1031.3.1 for emergency escape rescue openings.

2. Where the bottom of the clear opening of the window is located 75 feet (22 860 mm) or above from the finished grade or other surface below on the exterior of the building, the window shall comply with one of the following:

   2.1. Operable windows where the openings are provided with window fall prevention devices that comply with ASTM F2090.

   2.2. Operable windows where the openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.

   2.3. Window fall prevention devices that comply with ASTM F2006.

~~**1015.8.1 Window opening control devices.** Window opening control devices shall comply with F2090—17. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1031.3.1.~~

1016.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. *Exit access* through an enclosed elevator lobby is permitted. ~~Access to~~ Where access to two or more exits or exit access doorways is required in Section 1006.2.1, access to not less than one of the required *exits* shall be provided without travel through the enclosed elevator lobbies required by Section 3006. Where the path of *exit access* travel passes through an enclosed elevator lobby, the level of protection required for the enclosed elevator lobby is not required to be extended to the *exit* unless direct access to an *exit* is required by other sections of this code.

2. In other than Group H occupancies, egress from a room or space is allowed to pass through adjoining or intervening rooms or areas provided that such adjoining rooms or areas and the area served are accessory to one or the other and provide a discernible path of egress travel to an exit. ~~Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.~~

   ~~**Exception:** *Means of egress* are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy where the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.~~

3. In Group H occupancies, egress from a room or space is allowed to pass through adjoining or intervening rooms or areas provided that such adjoining rooms or areas are the same or lesser hazard occupancy group and provide a discernible path of egress travel to an exit.

4. An *exit access* shall not pass through a room that can be locked to prevent egress.

   Exception: An electrically locked exit access door providing egress from an elevator lobby shall be permitted in accordance with Section 1010.2.14.

5. *Means of egress* from *dwelling units* or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

6. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. *Means of egress* are not prohibited through a kitchen area serving adjoining rooms constituting part of the same *dwelling unit* or sleeping unit.
2. *Means of egress* are not prohibited through stockrooms in Group M occupancies where all of the following are met:
   2.1. The stock is of the same hazard classification as that found in the main retail area.
   2.2. Not more than 50 percent of the *exit access* is through the stockroom.
   2.3. The stockroom is not subject to locking from the egress side.
   2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) *aisle* defined by full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.

[BE] TABLE 1017.2

EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT AUTOMATIC SPRINKLER SYSTEM (feet)	WITH AUTOMATIC SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250b, e
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]

H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3	Not Permitted	200[c]
I-4	150	200[c]

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:

- Section 402.8 of the International Building Code: For the distance limitation in malls.
- ~~Section 404.9: For the distance limitation through an atrium space.~~
- Section 407.4 of the International Building Code: For the distance limitation in Group I-2.
- Sections 408.6.1 and 408.8.1 of the International Building Code: For the distance limitations in Group I-3.
- Section ~~411.3~~411.2 of the International Building Code: For the distance limitation in special amusement areas.
- Section 412.6 of the International Building Code: For the distance limitations in aircraft manufacturing facilities.
- Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
- Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
- Section 1006.3.4: For buildings with one exit.
- Section 1017.2.2: For increased distance limitation in Groups F-1 and S-1.
- Section 1017.2.3: For increased distance limitation in Group H-5
- Section 1030.7: For increased limitation in assembly seating.
- Section 3103.4 of the International Building Code: For temporary structures.
- Section 3104.9 of the International Building Code: For pedestrian walkways.

b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

d. Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.1.

e. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

1017.2.3 Group H-5 Increase. The maximum *exit access* travel distance shall be 300 feet (91 m) in the fabrication areas of Group H-5 occupancies where all of the following conditions are met:

1. The width of the fabrication area is 300 feet (91 m) or greater.
2. The area of the fabrication area is 220,000 sq. ft. (18,600 m^2) or greater.
3. The height of the fabrication area, measured between the raised metal floor and the clean filter ceiling, is 16 feet (48768 mm) or greater.

4. The supply ventilation rate is 20 cfm/sq. ft. or greater and shall remain operational.

[BE]1017.3 Measurement. Exit access travel distance shall be measured from the most remote point of each room, area or space along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit. Where more than one exit is required, exit access travel distance shall be measured to the nearest exit.

~~**Exception**~~**Exceptions:**

1. In open parking garages, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.
2. In smoke protected seating and open air assembly seating, exit access travel distance shall be measured in accordance with Section 1030.7.

1017.3.2 Atriums. Exit access travel distance for areas open to an atrium shall comply with the requirements of Sections 1017.3.2.1 through 1017.3.2.3.

1017.3.2.1 Egress not through the atrium. Where required access to the exits is not through the atrium, exit access travel distance shall comply with Section 1017.2.

1017.3.2.2 Exit access travel distance at the level of exit discharge. Where the path of egress travel is through an atrium space, exit access travel distance at the level of exit discharge shall be determined in accordance with Section 1017.2.

1017.3.2.3 Exit access travel distance at other than the level exit discharge. Where the path of egress travel is not at the level of exit discharge from the atrium, that portion of the total permitted exit access travel distance that occurs within the atrium shall be not greater than 200 feet (60 960 mm).

1019.3 Occupancies other than Groups I-2 and I-3. In other than Group I-2 and I-3 occupancies, floor openings containing *exit access stairways* or *ramps* ~~that do not comply with one of the conditions listed in this section~~ shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

Exceptions:

1. *Exit access stairways* and *ramps* within a two-story opening complying with Section 712.1.9 of the International Building Code. ~~that serve or atmospherically communicate between only two stories. Such interconnected stories shall not be open to other stories.~~
2. In Group R-1, R-2 or R-3 occupancies, *exit access stairways* and *ramps* connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
3. *Exit access stairways* serving and contained within a Group R-3 congregate residence or a Group R-4 facility are not required to be enclosed.
4. *Exit access stairways* and *ramps* in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or *ramp* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. *Exit access stairways* and *ramps* within an *atrium* complying with the provisions of Section 404.
6. Exit access stairways and ramps in open parking garages that serve only the parking garage.
7. *Exit access stairways* and *ramps* serving smoke-protected or *open-air assembly seating* complying with the exit access travel distance requirements of Section 1030.7.
8. *Exit access stairways* and *ramps* between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, *places of religious worship*, auditoriums and sports facilities.
9. Exterior exit access stairways or ramps between occupiable roofs.

1020.1 General. Corridors serving as an exit access component in a means of egress system shall comply with the requirements of Sections 1020.2 and 1020.7.

Subsequent sections renumbered

[BE]TABLE 1020.2

CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without automatic sprinkler system	With automatic sprinkler system
H-1, H-2, H-3	All	Not Permitted	1[c]
H-4, H-5	Greater than 30	Not Permitted	1[c]
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5[c]/1[d]
I-2[a]	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b, c]
I-4	All	1	0

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3 of the International Building Code.

b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8 of the International Building Code.

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

d. Group R-3 and R-4 buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3. See Section 903.2.8 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.3.

[BE] 1020.2.1 Hoistway protection. Elevator hoistway doors in elevators hoistway enclosures required to be fire-resistance rated shall be protected in accordance with Section 716 of the International Building Code.

Elevator hoistway doors shall also be protected in accordance with Section 3006.2 of the International Building Code.

1020.5~~1020.4~~ Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that dead-end corridors do not exceed 20 feet (6096 mm) in length.

Exceptions:

1.In Group I-3, Condition 2, 3 or 4, occupancies, the dead end in a corridor shall not exceed 50 feet (15 240 mm).

2.In occupancies in Groups B, E, F, I-1, M, R-1, R-2, S and U, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet (15 240 mm).

3.A dead-end corridor shall not be limited in length where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor.

4.In Group I-2, Condition 2 occupancies, the length of dead end corridors that do not serve patient rooms or patient treatment spaces shall not exceed 30 feet (9144 mm).

~~1020.5~~ 1020.6 **Air movement in corridors.** Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:

1.Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.

2.Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.

3.Where located within tenant spaces of 1,000 square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.

4.~~Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.~~ Transfer air movement required to maintain pressurization difference within health care facilities in accordance with ASHRAE 170.

1023.2 Construction. Enclosures for interior exit *stairways* and *ramps* shall be constructed as *fire barriers* in accordance with Section 707 of the Building Code of New York State or *horizontal assemblies* constructed in accordance with Section 711 of the Building Code of New York State, or both. *Interior exit stairway* and *ramp* enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit *stairways* or *ramps* shall include any *basements*, but not any *mezzanines*. Enclosure for interior ~~Interior~~ *exit stairways* and *ramps* shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. 1.*Interior exit stairways* and *ramps* in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.
2. 2.*Interior exit stairways* within an *atrium* enclosed in accordance with Section 404.6.
3. Interior exit stairway in accordance with Section 510.2 of the Building Code of New York State.

1023.5 Penetrations. Penetrations into or through *interior exit stairways* and *ramps* are prohibited except for the following:

1. Equipment and ductwork necessary for independent ventilation or pressurization.
2. Fire protection systems.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication systems.
6. Electrical raceway serving the *interior exit stairway* and *ramp* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).
7. Structural elements, such as beams or joists, supporting the interior exit stairway and ramp or enclosure.
8. Structural elements, such as beams or joists, supporting a roof at the top of the *interior exit stairway* or *ramp*.

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communication openings, whether protected or not, between adjacent interior exit *stairways* and *ramps*.

Exception: *Membrane penetrations* shall be permitted on the outside of the *interior exit stairway* and *ramp*. Such penetrations shall be protected in accordance with Section 714.4.2.

1023.7 Interior exit stairway and ramp exterior walls. *Exterior walls* of the *interior exit stairway* or *ramp* shall comply with the requirements of Section 705 for *exterior walls*. Where nonrated walls or unprotected openings enclose the exterior of the *stairway* or *ramps* and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), building construction within 10 feet of the exterior walls of the interior exit stairway or ramp shall comply with Section 1023.7.1 and 1023.7.2. ~~the building *exterior walls* within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a *fire-resistance rating* of not less than 1 hour. Openings within such *exterior* walls shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the *stairway* or *ramp*, or to the roof line, whichever is lower.~~

1023.7.1 Building exterior walls. Building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening in an interior exit stairway or ramp shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or ramp, or to the roof line, whichever is lower.

1023.7.2 Roof assemblies. Where the interior exit stairway or ramp extends above an adjacent roof of the same building, the adjacent roof assembly shall have a fire resistance rating of not less than 1 hour and openings shall be protected by opening protectives having a fire protection rating of not less than ¾ hour. The fire resistance rating and opening protection shall extend horizontally a minimum of 10 feet (3048 mm) from the exterior wall of the stairway or ramp, or to the perimeter of the adjacent roof, whichever is less.

Exceptions:

1. The roof assembly need not be rated and openings in the roof need not be protected where they are adjacent to the *penthouse* of the stairway or ramp, unless otherwise required by this code.
2. The adjacent roof assembly need not be rated and adjacent openings in the roof need not be protected where the exterior wall of the stairway or ramp has a fire-resistance rating of 1 hour and openings are protected by opening protectives having a fire protection rating of not less than 3/4 hours, extending a minimum of 10 feet (3048 mm) above the roof.

[BE] 1023.8 ~~**Discharge identification**~~ **Barriers at level of exit discharge.** An interior exit stairway and ramp shall not continue below its level of exit discharge unless an approved barrier is provided at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be provided as specified in Section 1013.

1023.9 Stairway identification signs. A sign shall be provided at each floor landing in an interior exit stairway and ramp connecting more than three stories designating the floor level, the terminus of the top and bottom of the interior exit stairway and ramp and the identification of the stairway or ramp. The signage shall state the story of and direction to the exit discharge, and the availability of roof access from the interior exit stairway and ramp for the fire department. The bottom of the sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. ~~In addition to the stairway identification sign, a floor-level sign in visual characters, raised characters and braille complying with ICC A117.1 shall be located at each floor-level landing adjacent to the door leading from the interior exit stairway and ramp into the corridor to identify the floor level.~~

1023.11 Tactile floor-level signs. Where floor level signs are provided in interior exit stairways and ramps, a floor-level sign in visual characters, raised characters and braille complying with ICC A117.1 shall be located at each floor-level landing adjacent to the door leading from the interior exit stairway and ramp into the corridor.

1024.1 ~~**Exit passageways**~~ **General.** Exit passageways serving as an exit component in a means of egress system shall comply with the requirements of this section. An exit passageway shall not be used for any purpose other than as a means of egress and a circulation path.

1024.6 Penetrations. Penetrations into or through an *exit passageway* are prohibited except for the following:

1. Equipment and ductwork necessary for independent ventilation or pressurization.

2. Fire protection systems.
3. Security systems.
4. Two-way communication systems.
5. Electrical raceway for fire department communication.
6. Electrical raceway serving the *exit passageway* and terminating at a steel box not exceeding 16 square inches (0.010 m^2).
7. Structural elements, such as beams and joists, supporting a floor or roof at the top of the exit passageway.

Such penetrations shall be protected in accordance with Section 714. There shall not be penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

> **Exception:** *Membrane penetrations* shall be permitted on the outside of the *exit passageway*. Such penetrations shall be protected in accordance with Section 714.4.2.

[BE] 1024.8 Exit passageway exterior walls. Exterior walls of the exit passageway shall comply with Section 705. Where nonrated walls or unprotected openings enclose the exterior of the exit passageway and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor of the exit passageway or to the roof line, whichever is lower.

1026.1 ~~Horizontal exits~~ General. Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit minimum width or required capacity shall be horizontal exits.

Exceptions:

1. 1.Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. 2.Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. Not less than 6 square feet (0.6 m2) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

1026.4.1 Capacity. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m2) for each occupant to be accommodated therein. Where the horizontal exit also forms a smoke compartment, the capacity of the refuge area for Group I-1, I- 2 and I-3 occupancies and ~~Group B~~ ambulatory care facilities shall comply with Sections 407.5.3, 408.6.2, 420.6.1 and 422.3.2 as applicable.

1027.1 ~~Exterior exit stairways and ramps~~ General. Exterior exit stairways and ramps serving as an ~~element of~~ exit component in a ~~required~~ means of egress system shall comply with the requirements of this section.

1027.2 Use in a means of egress. *Exterior exit stairways* shall not be used as an element of a required *means of egress* for Group I-2 occupancies. For occupancies in other than Group I-2, *exterior exit stairways* and *ramps* shall ~~be permitted~~ not be used as an element of a required *means of egress* for buildings ~~not~~ exceeding six stories above grade plane or that are ~~not~~ high-rise buildings.

1028.1 General. The exit discharge shall comply with Sections 1028 and 1029 and the applicable requirements of Sections 1003 through 1015.

~~1028.1~~ 1028.2 ~~General.~~ Exit discharge. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide a direct path of egress travel to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required exits.

Exceptions:

1.Not more than 50 percent of the number and minimum width or required capacity of interior exit stairways and ramps is permitted to egress through areas, including atriums, on the level of discharge provided that all of the following conditions are met:

1.1.Discharge of interior exit stairways and ramps shall be provided with a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the enclosure.

1.2.The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the enclosure.

1.3.The egress path from the interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. Portions of the level of exit discharge with access to the egress path shall be either equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of interior exit stairways or ramps.

1.4.Where a required interior exit stairway or ramp and an exit access stairway or ramp serve the same floor level and terminate at the same level of exit discharge, the termination of the exit access stairway or ramp and the exit discharge door of the interior exit stairway or ramp shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the interior exit stairway or ramp and the last tread of the exit access stairway or termination of slope of the exit access ramp.

2.Not more than 50 percent of the number and minimum width or required capacity of the interior exit stairways and ramps is permitted to egress through a vestibule provided that all of the following conditions are met:

2.1.The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating of the interior exit stairway or ramp enclosure.

2.2.The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

2.3.The area is separated from the remainder of the level of exit discharge by a fire partition constructed in accordance with Section 708.

Exception: The maximum transmitted temperature rise is not required.

2.4.The area is used only for means of egress and exits directly to the outside.

3.Horizontal exits complying with Section 1026 shall not be required to discharge directly to the exterior of the building.

SECTION 1029
EGRESS COURTS

~~1028.4~~1029.1~~Egress courts~~**General.** Egress courts serving as ~~a portion of the~~ an exit discharge component in the means of egress system shall comply with the requirements ~~of Sections 1028.4.1 and 1028.4.2.~~in this section.

~~1028.4.1~~1029.2 **Width or capacity.** The required capacity of egress courts shall be determined as specified in Section 1005.1, but the minimum width shall be not less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall be not less than 36 inches (914 mm) in width. The required capacity and width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

The width of the egress court shall be not less than the required capacity.

Exception: Encroachments complying with Section 1005.7.

~~1028.4.2~~1029.3 **Construction and openings.** Where an egress court serving a building or portion thereof is less than 10 feet (3048 mm) in width, the egress court walls shall have not less than 1-hour fire-resistance-rated construction for a distance of 10 feet (3048 mm) above the floor of the egress court.

Openings within such walls shall be protected by opening protectives having a fire protection rating of not less than ¾ hour.

Exceptions:

1. Egress courts serving an occupant load of less than 10.
2. *Egress courts* serving Group R-3.
3. Egress courts, located at ***grade***, which provide direct and unobstructed access to a ***public way*** through two or more independent paths. The minimum width provided along each path shall be based on the required width or the required capacity, whichever is greater, and shall be maintained along each path.

~~**1029.6.2**~~ **1030.6.2 Smoke-protected assembly seating.** The required capacity in inches (mm) of the aisle for smoke-protected assembly seating shall be not less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1030.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1030.6.2 for smoke-protected assembly seating.

~~**Exception:** For open-air assembly seating with an occupant load not greater than 18,000, the required capacity in inches (mm) shall be determined using the factors in Section 1029.6.3.~~

TABLE 1030.6.2~~1029.6.2~~
CAPACITY FOR AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKE-PROTECTED ASSEMBLY SEATING	INCHES OF CAPACITY PER SEAT SERVED			
	Stepped aisles with handrails within 30 inches	Stepped aisles without handrails within 30 inches	Level aisles or ramped aisles not steeper than 1 in 10 in slope	Ramped aisles steeper than 1 in 10 in slope
Equal to or less than 5,000	0.2	0.25	0.15	0.165
10,000	0.13	0.163	0.1	0.11
15,000	0.096	0.12	0.07	0.077
20,000	0.076	0.095	0.056	0.062
Equal to or greater than 25,000	0.06	0.075	0.044	0.048

For SI:1 inch = 25.4 mm.

~~**1029.6.2.3**~~ **1030.6.2.3 Automatic sprinklers.** Enclosed areas with walls and ceilings in buildings or structures containing smoke-protected assembly seating shall be protected with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Exceptions:

1.The floor area used for contests, performances or entertainment provided that the roof construction is more than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.

2.Press boxes and storage facilities less than 1,000 square feet (93 m^2) in area.

~~3.Outdoor seating facilities where seating and the means of egress in the seating area are essentially open to the outside.~~

~~**1029.6.3**~~ **1030.6.3Open-air assembly seating.** In open-air assembly seating, the required capacity in inches (mm) of aisles shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by stepped aisle and multiplied by 0.06 (1.52 mm) where egress is by level aisles and ramped aisles.

Exception: The required capacity in inches (mm) of aisles shall be permitted to comply with Section 1030.6.2 for the number of seats in the open-air assembly seating where Section 1030.6.2 permits less capacity.

1030.6.3.1 Automatic sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing open-air assembly seating shall be protected with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Exceptions:

1.The floor area used for contests, performances or entertainment provided the roof construction is more than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.

2.Press boxes and storage facilities less than 1,000 square feet (93 m^2) in area.

3.Open-air assembly seating facilities where seating and the means of egress in the seating area are essentially open to the outside.

1030.8 Common path of egress travel. The *common path of egress travel* for a room or space used for assembly purposes having fixed seating shall not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two *exits*.

Exceptions:

1. For areas serving less than 50 occupants, the *common path of egress travel* shall not exceed 75 feet (22 860 mm).
2. For *smoke-protected* or *open-air assembly seating*, the *common path of egress travel* shall not exceed 50 feet (15 240 mm).

1030.9.5 Dead-end aisles. Each end of an *aisle* shall be continuous to a cross *aisle*, foyer, doorway, vomitory, concourse or *stairway* in accordance with Section 1030.9.7 having access to an *exit*.

Exceptions:

1. Dead-end *aisles* shall be not greater than 20 feet (6096 mm) in length.
2. Dead-end *aisles* longer than ~~16 rows~~ 20 feet (6096 mm) are permitted where seats beyond the ~~16th row~~ 20 feet (6096 mm) dead-end *aisle* are not more than 24 seats from another *aisle*, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.
3. Dead-end aisles serving fewer than 50 seats shall be permitted in accordance with Section 1030.8.
4. For *smoke-protected* or *open-air assembly seating*, ~~the~~ dead-end ~~aisle length of~~ vertical *aisles* ~~shall not exceed a distance~~ of 21 rows or fewer.
5. For *smoke-protected* or *open-air assembly seating*, ~~a longer~~ dead-end *aisles* ~~is permitted where seats~~ beyond the 21-row dead-end *aisle* where such rows are not more than 40 seats from another *aisle*, measured along a row of seats having an *aisle* accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.

[BE] TABLE 10~~29~~30.13.2.1 SMOKE-PROTECTED OR OPEN-AIR ASSEMBLY AISLE ACCESSWAYS

NUMBER OF SEATS IN THE SMOKE-PROTECTED OR OPEN-AIR ASSEMBLY SEATING	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY			
	Aisle or doorway at both ends of row		Aisle or doorway at one end of row only	
	Seats with backrests	Seats without backrests	Seats with backrests	Seats without backrests
Less than 4,000	14	21	7	10
4,000 to 6,999	15	22	7	10
7,000 to 9,999	16	23	8	11
10,000 to 12,999	17	24	8	11
13,000 to 15,999	18	25	9	12
16,000 to 18,999	19	26	9	12
19,000 to 21,999	20	27	10	13
22,000 and greater	21	28	11	14

1030.16 ~~**1029.16**~~ **Handrails.** Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped aisles shall be provided with handrails in compliance with Section 1014 located either at one or both sides of the aisle or within the aisle width. Where stepped aisles have seating on one side and the aisle width is 74 inches (1880 mm) or greater, two handrails are required. Where two handrails are required, one of the handrails shall be within 30 inches horizontally of the of the side of the tiered floor adjacent to the stepped aisle.

Exceptions:

1. 1.Handrails are not required for ramped aisles with seating on both sides.
2. 2.Handrails are not required where, at the side of the aisle, there is a guard with a top surface that complies with the graspability requirements of handrails in accordance with Section 1014.3.
3. 3.Handrail extensions are not required at the top and bottom of stepped aisles and ramped aisles to permit crossovers within the aisles.

~~**1029.16.1**~~ **1030.16.1 Discontinuous handrails.** Where there is seating on both sides of the aisle, the mid-aisle handrails shall be ~~discontinuous with~~ discontinuous. Where a stepped aisle is required to have two handrails, the mid-aisle handrails shall be discontinuous. G~~g~~aps or breaks shall be provided at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of not less than 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the mid-aisle handrail shall have rounded terminations or bends.

~~**1029.16.2**~~ **1030.16.2 Handrail termination.** Handrails located on the side of stepped aisles shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stepped aisle flight.

~~**1029.16.3**~~ **1030.16.3 Mid-aisle termination.** Mid-aisle handrails shall not extend beyond the lowest riser and shall terminate within 18 inches (381 mm), measured horizontally, from the lowest riser. Handrail extensions are not required.

Exception: Mid-aisle handrails shall be permitted to extend beyond the lowest riser where the handrail extensions do not obstruct the width of the cross aisle.

SECTION ~~1030~~1031

EMERGENCY ESCAPE AND RESCUE

1031.1 General. Emergency escape and rescue openings shall comply with the requirements of this section.

~~1030.1~~1031.2 ~~General.~~ Where required. In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following occupancies:

1. Group R-2 occupancies located in stories with only one *exit* or *access* to only one *exit* as permitted by Tables 1006.3.4(1) and 1006.3.4(2).
2. Group R-3 and R-4 occupancies.

Basements and sleeping rooms below the fourth *story above grade plane* shall have not fewer than one ~~exterior~~ *emergency escape and rescue opening* in accordance with this section. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue* ~~openings~~ *opening* shall be required in each sleeping room, but shall not be required in adjoining areas of the *basement*. Such openings shall open directly into a *public way*, or to a *yard*, or *court* that opens to a *public way*, or to an egress balcony that leads to a *public way*.

Exceptions:

1. *Basements* with a ceiling height of less than 80 inches (2032 mm) shall not be required to have *emergency escape and rescue openings*.
2. *Emergency escape and rescue openings* are not required from *basements* or sleeping rooms that have an *exit* door or *exit access* door that opens directly into a *public way* or to a *yard*, court or exterior ~~exit~~ egress balcony that ~~opens~~ that leads to a *public way*.
3. *Basements* without *habitable spaces* and having not more than 200 square feet (18.6 m^2) in floor area shall not be required to have emergency escape and rescue openings.
4. Storm shelters are not required to comply with this section where the shelter is constructed in accordance with ICC 500.
5. Within individual *dwelling* and *sleeping units* in Groups R-2 and R-3, where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, *sleeping rooms* in *basements* shall not be required to have *emergency escape and rescue openings* provided that the basement has one of the following:

   5.1. One means of egress and one emergency escape and rescue opening.

   5.2. Two means of egress.

1031.3 Emergency escape and rescue openings. Emergency escape and rescue openings shall comply with Sections 1031.3.1 through 1031.3.3.

~~1030.2~~1031.3.1 Minimum size. Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.53 m^2).

Exception: The minimum net clear opening for grade-floor emergency escape and rescue openings shall be 5 square feet (0.46 m2).

~~1030.2.1~~1031.3.2 Minimum dimensions. The minimum net clear opening height dimension shall be 24 inches (610 mm). The minimum net clear opening width dimension shall be 20 inches (508 mm). The net clear opening dimensions shall be the result of normal operation of the opening.

~~1030.3~~1031.3.3 Maximum height from floor. Emergency escape and rescue openings shall have the bottom of the clear opening not greater than 44 inches (1118 mm) measured from the floor.

1031.4 Emergency escape and rescue doors. Where a door is provided as the required emergency escape and rescue opening, it shall be a swinging door or a sliding door.

~~**1030.4**~~**1031.5 ~~Window~~ Area wells.** An emergency escape and rescue opening ~~with a finished sill height~~ the bottom of the clear opening below the adjacent ~~ground level~~ grade shall be provided with ~~a window~~ an area well in accordance with Sections ~~1030.4.1~~ 1031.5.1 ~~and 1030.4.2~~ through 1031.5.3.

~~**1030.4.1**~~ **1031.5.1 Minimum size**. The minimum horizontal area of the ~~window~~ area well shall be 9 square feet (0.84 m^2), with a ~~minimum dimension of~~ horizontal projection and width of not less than 36 inches (914 mm). The area ~~of the window~~ well shall allow the emergency escape and rescue opening to be fully opened.

> **Exception**: The ladder or steps required by Section 1031.5.2 shall be permitted to encroach not more than 6 inches (152 mm) into the required dimensions of the area well.

~~**1030.4.2**~~ **1031.5.2 Ladders or steps.** ~~Window~~ Area wells with a vertical depth of more than 44 inches (1118 mm) shall be equipped with an approved permanently affixed ladder or steps. ~~Ladders or rungs shall have an inside width of not less than 12 inches (305 mm), shall project not less than 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the window well. The ladder or steps shall not encroach into the required dimensions of the window well by more than 6 inches (152 mm).~~ The ladder or steps shall not be obstructed by the emergency escape and rescue opening~~.~~ when the window or door is in the open position. Ladders or steps required by this section ~~are exempt from the stairway requirements~~ ~~of~~ shall not be required to comply with Section 1011.

1031.5.2.1 Ladders. Ladders or rungs shall have an inside width of at least 12 inches (305 mm), shall project at least 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center (o.c.) vertically for the full height of the area well.

1031.5.2.2 Steps. Steps shall have an inside width of not less than 12 inches (305 mm), shall have treads greater than 5 inches (127 mm) in depth and a riser height not greater than 18 inches (457 mm) for the full height of the area well.

1031.5.3 Drainage. Area wells shall be designed for proper drainage by connecting to the building's foundation drainage system required by Section 1805 of the Building Code of New York State.

> **Exception:** A drainage system for area wells is not required where the foundation is on well-drained soil or sand-gravel mixture soils in accordance with the United Soil Classification System, Group I Soils, in accordance with Section 1803.5.1 of the Building Code of New York State.

~~**1030.5**~~**1031.6 Bars, grilles, covers and screens.** ~~Bars~~ Where bars, grilles, covers, screens or similar devices ~~are permitted to be~~ placed over emergency escape and rescue openings~~, bulkhead enclosures~~ or ~~window~~ area wells that serve such openings, ~~provided that~~ the minimum net clear opening size ~~complies~~ shall comply with Sections ~~1030.1.1 through 1030.4.2~~ 1031.3 and ~~such~~ 1031.5. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation ~~of the emergency escape and rescue opening. Where such bars, grilles, covers, screens or similar devices are installed in existing buildings, they shall not reduce the net clear opening~~ of the emergency escape and rescue opening ~~and smoke alarms shall be installed in accordance with Section 907.2.10 regardless of the valuation of the alteration~~.

1032.2.2 Fire escapes. Security enclosures, fences, or screening for fire escape stairways shall be approved by the fire code official and shall be constructed such that they do not impede egress to the public way. Means shall be provided for access to the fire escape stair by emergency personnel from the exterior of the enclosure.

1032.2.2.1 Maintenance. Fire escape stairways and balconies shall be kept clear and unobstructed at all times and shall be maintained in good working order.

1032.2.2.2 Examination. Fire escape stairways and balconies shall be examined for structural adequacy and safety by a registered design professional or other person acceptable to the fire code official every 5 years. The examination shall determine whether the fire escape stairways and balconies can support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). An inspection report shall be submitted to the fire code official after such examination.

~~**1031.2.2**~~ **1032.2.3 Locking arrangements in educational occupancies.** In Group E occupancies, Group B educational occupancies and Group I-4 occupancies, egress doors ~~from classrooms, offices and other occupied rooms shall be permitted to be provided~~ with locking arrangements designed to keep intruders from entering the room shall comply with Section 1010.2.8. ~~where all of the following conditions are met:~~

> ~~1.The door shall be capable of being unlocked from outside the room with a key or other approved means.~~
>
> ~~2.The door shall be openable from within the room in accordance with Section 1010.1.9.~~

~~3.Modifications shall not be made to existing listed panic hardware, fire door hardware or door closers.~~

~~4.Modifications to fire door assemblies shall be in accordance with NFPA 80.~~

~~1031.3.1~~ 1032.3.1 **Group I-2.** In Group I-2, the required clear width for *aisles*, *corridors* and *ramps* that are part of the required *means of egress* shall comply with Section 407.4.3 of the International Building Code and Section 1020.2. The facility shall have a plan to maintain the required clear width during emergency situations.

Exception: In areas required for bed movement, equipment shall be permitted in the required width where all of the following provisions are met:

1.The equipment is low hazard and wheeled.

2.The equipment does not reduce the effective clear width for the *means of egress* to less than 5 feet (1525 mm).

3.The equipment is limited to:

3.1.Equipment and carts in use.

3.2.Medical emergency equipment.

3.3.Infection control carts.

3.4.Patient lift and transportation equipment.

4.Medical emergency equipment and patient lift and transportation equipment, when not in use, are required to be located on one side of the *corridor*.

5.The equipment is limited in number to not more than one per patient sleeping room or patient care room within each *smoke compartment.*

~~1031.7~~ 1032.7 **Emergency escape and rescue openings.** Required emergency escape and rescue openings shall be maintained in accordance with the ~~that was~~ code in effect at the time of construction, and both of the following:

1.Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools.

2.Bars, grilles, grates or similar devices are ~~allowed~~ permitted to be placed over emergency escape and rescue openings provided that the minimum net clear opening size complies with the code that was in effect at the time of construction and ~~such~~ the unit is equipped with smoke alarms installed in accordance with Section 907.2.10 of the International Building Code. Such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.

1032~~1~~.8 Inspection, testing and maintenance. ~~Two-way communication systems shall be inspected and tested on a yearly basis to verify that all components are operational. Where required, the tests shall be conducted in the presence of the fire code official. Records of inspection, testing and maintenance shall be maintained~~ The inspection, testing and maintenance for two-way communication systems shall be in accordance with this code and NFPA 72, and shall be conducted not less than annually or more frequently where required by the *fire code official*.

1032~~1~~.8.1 Records. Records of inspections, testing and maintenance shall be maintained on site in a location approved by the *fire code official*.

[NY] 1032~~1~~.11 ~~12~~**Posting of occupant load.** Every room or space that is an assembly occupancy shall have the occupant load posted in accordance with Section 1004.9. ~~of the room or space posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved, legible, permanent design and shall be maintained by the owner or authorized agent.~~

[NY] 1032~~1~~.12~~11~~ **Capacity of means of egress.** The occupant load of buildings or portions thereof shall not exceed the approved capacity of the means of egress. ~~from the buildings or portions thereof. Occupant load shall be calculated as provided in Section 1004.1. Capacity of the means of egress shall be calculated as provided in Sections 1005 and 1006.~~

[NY] 103~~1~~2.13 Overcrowding. It shall be prohibited for buildings, or portions thereof, to be overcrowded. The building owner or authorized agent shall be responsible to ensure buildings, or portions thereof, are not overcrowded.

CHAPTER 11 CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

[NY]1103.2 ~~Reserved~~ Emergency responder communication enhancement in existing buildings. Existing buildings other than Group R-3, that do not have approved in-building, emergency response communication enhancement systems, shall be equipped with such coverage according to one of the following:

Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 510.1, Exception 1.

Where an existing building is undergoing a level 3 alteration or is being relocated.

Where an existing building is undergoing a level 2 alteration and inadequate emergency responder communication capabilities have been documented by emergency responders, and filed with the fire code official, provided that the existing emergency responder communication capabilities does not meet the requirements of section 510.4 at the time of alteration.

> **Exception:** Where it is determined by the fire code official that the in-building, emergency responder communication enhancement system is not needed.

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

Exceptions:

11. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where protected at the elevator shaft openings with additional fire doors in accordance with Section 716 of the International Building Code and where all of the following conditions are met:
    1.1. The doors shall be provided with vision panels of *approved* fire-protection-rated glazing so located as to furnish clear vision of the approach to the elevator. Such glazing shall not exceed 100 square inches (0.065 m^2) in area.
    1.2. The doors shall be held open but be automatic-closing by activation of a fire alarm initiating device installed in accordance with the requirements of NFPA 72 as for Phase I Emergency Recall Operation, and shall be located at each floor served by the elevator; in the associated elevator machine room, control space, or control room; and in the elevator hoistway, where sprinklers are located in those hoistways.
    1.3. The doors, when closed, shall have signs visible from the approach area stating: "WHEN THESE DOORS ARE CLOSED OR IN CASE OF FIRE ~~EMERGENCY~~, ~~DO NOT USE ELEVATOR~~ ELEVATORS ARE OUT OF SERVICE. USE EXIT ~~STAIRWAYS~~."
12. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where provided with *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
13. Freight elevators in buildings provided with both *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and not less than one ASME 17.3-compliant elevator serving the same floors.

Elimination of previously installed Phase I emergency recall or Phase II emergency in-car systems shall not be permitted.

1103.4.1 Group I-2 and I-3 occupancies. In Group I-2 and I-3 occupancies, interior vertical openings connecting two or more stories shall be protected with 1-hour *fire-resistance-rated* construction.

Exceptions:

1. In Group I-2, unenclosed vertical openings not exceeding two connected stories and not concealed within the building construction shall be permitted as follows:

1.1. The unenclosed vertical openings shall be separated from other unenclosed vertical openings serving other floors by a *smoke barrier*.

1.2. The unenclosed vertical openings shall be separated from corridors by *smoke partitions*.

1.3. The unenclosed vertical openings shall be separated from other fire or *smoke compartments* on the same floors by a *smoke barrier*.

1.4. On other than the lowest level, the unenclosed vertical openings shall not serve as a required *means of egress.*

2. In Group I-2, atriums connecting three or more stories shall not require 1-hour *fire-resistance-rated* construction where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3, and all of the following conditions are met:

2.1. For other than existing *approved* atriums with a smoke control system, where the atrium was constructed and is maintained in accordance with the code in effect at the time the atrium was created, the atrium shall have a smoke control system that is in compliance with Section 909.

2.2. Glass walls forming a smoke partition or a glass-block wall assembly shall be permitted where in compliance with Condition 2.2.1 or 2.2.2.

2.2.1. Glass walls forming a smoke partition shall be permitted where all of the following conditions are met:

2.2.1.1. Automatic sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway or occupied space on the atrium side.

2.2.1.2. The sprinklers shall be not more than 12 inches (305 mm) away from the face of the glass and at intervals along the glass of not greater than 72 inches (1829 mm).

2.2.1.3. Windows in the glass wall shall be nonoperating type.

2.2.1.4. The glass wall and windows shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the *automatic sprinkler system* operates.

2.2.1.5. The *automatic sprinkler system* shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction.

2.2.2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 of the *International Building Code* and having a / -hour *fire protection rating* is provided.

2.3. Where doors are provided in the glass wall, they shall be either self-closing or automatic-closing and shall be constructed to resist the passage of smoke.

3. In Group I-3 occupancies, *exit stairways* or *ramps* and *exit access stairways* or *ramps* constructed in accordance with Section 408 of the *International Building Code*.

1103.5.4 High-rise buildings. Where Appendix M has not been adopted, existing high-rise buildings that do not have a previously *approved automatic sprinkler system* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where any of the following conditions apply:

1. The high-rise building has an occupied floor located more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access.

2. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have at least two *interior exit stairways* complying with Section 1104.10 that are separated from the building interior by fire assemblies having a *fire-resistance rating* of not less than 2 hours with opening protection in accordance with Table 716.1(2) of the *International Building Code*.

3. The high-rise building has occupied floors located more than 75 feet (22 860 mm) and not more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, and the building does not have a fire alarm system that includes smoke detection in mechanical equipment, electrical, transformer, telephone equipment and similar rooms; *corridors*; elevator lobbies; and at doors penetrating interior exit stairway enclosures.

Building *owners* shall file a compliance schedule with the *fire code official* not later than 365 days after receipt of a written notice. The compliance schedule shall not exceed 12 years for completion of the *automatic sprinkler system* retrofit.

~~1103.5.4~~ 1103.5.5 Pyroxylin plastics….

1103.7.5.1 Group R-1 hotel and motel 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 existing Group R-1 hotels and motels more than ~~three stories~~ one story in height or with more than 20 *dwelling units* or *sleeping units* in aggregate.

Exceptions:

~~1.Buildings~~ A manual fire alarm system is not required in buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire-resistance-rated* construction and each *sleeping unit* has direct access to a *public way*, *egress court* or yard.

2. A manual fire alarm system is not required in buildings not more than three stories in height with not more than 20 *dwelling units* or *sleeping units* in aggregate and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

3.Manual fire alarm boxes are not required throughout the building where the following conditions are met:

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

3.2 The notification appliances will activate upon sprinkler water flow.

3.3 Not less than one manual fire alarm box is installed at an *approved* location.

1103.7.5.1.1 Group R-1 hotel and motel 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 existing Group R-1 hotels and motels throughout all interior *corridors* serving sleeping rooms not equipped with an *approved*, supervised *automatic sprinkler system* installed in accordance with Section 903.

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

1103.7.5.2 Group R-1 boarding and rooming houses 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 existing Group R-1 boarding and rooming houses.

Exception: Buildings less than two stories in height where all *dwelling units*, *sleeping units*, attics and crawl spaces are separated by 1-hour *fire- resistance-rated* construction and each *dwelling unit* or *sleeping unit* has direct access to a *public way*, *egress court* or yard.

1103.7.5.2.1 Group R-1 boarding and rooming houses 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 existing Group R-1 boarding and rooming houses throughout all interior *corridors* serving *dwelling units* or *sleeping units* not equipped with an *approved*, supervised sprinkler system installed in accordance with Section 903.

Exception: Buildings equipped with single-station smoke alarms meeting or exceeding the requirements of Section 907.2.11.1 and where the fire alarm system includes not less than one manual fire alarm box per floor arranged to initiate the alarm.

[NY] 1103.9 Carbon monoxide ~~alarms~~ detection. Carbon monoxide ~~alarms~~ detection shall be ~~provided as required by the Existing Building Code of New York State~~ installed in existing buildings in accordance with Section 915.

~~Exceptions:~~

~~1. Carbon monoxide alarms are permitted to be solely battery operated where the code that was in effect at the time of construction did not require carbon monoxide detectors to be provided.~~

~~2. Carbon monoxide alarms are permitted to be solely battery operated in dwelling units that are not served from a commercial power source.~~

~~3. A carbon monoxide detection system in accordance with Section 915.5 shall be an acceptable alternative to carbon monoxide alarms.~~

1104.5 Illumination emergency power. Where *means of egress* illumination is provided, the power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more *means of egress*:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an *occupant load* of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a *level of exit discharge* serving the occupants or buildings with 1,000 or more total occupants.
3. Group E in interior *exit access* and *exit stairways* and *ramps*, *corridors*, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours and that are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m^2) in gross sales area on one story only, excluding mezzanines.

~~7. Group R-1.~~

   ~~**Exception:** Where each *sleeping unit* has direct access to the outside of the building at grade.~~

7. Groups R-1 and R-2.

   Exception: Where each *dwelling unit* or *sleeping unit* has direct access to the outside of the building at grade.

Revise all instances of occupied with occupiable (occupiable ~~occupied~~) and unoccupied with unoccupiable (unoccupiable ~~unoccupied~~) in the title (as shown below) and/or body of the following sections:

1104.4 Multistory buildings and facilities…

1104.7 Size of doors. The required capacity of each door opening shall be sufficient for the occupant load thereof and shall provide a minimum clear opening width of 28 inches (711 mm). Where this section requires a minimum clear opening width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The minimum clear opening height of doorways shall be 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required *means of egress* in occupancies in Group R-2 and R-3 units that are not required to be an Accessible Type A unit or Type B unit.

2. Door openings to storage closets less than 10 square feet (0.93 m) in area shall not be limited by the minimum clear opening width.

3. The width of door leaves in revolving doors that comply with Section 1010.3.1 shall not be limited.

4. The maximum width of door leaves in power-operated doors that comply with Section 1010.3.2 shall not be limited.

5. Door openings within a *dwelling unit* shall have a minimum clear opening height of 78 inches (1981 mm).

6. In *dwelling* and *sleeping units* that are not required to be Accessible units, Type A units or Type B units, exterior door openings, other than the required exit door, shall have a minimum clear opening height of 76 inches (1930 mm).

7. *Exit access* doors serving a room not larger than 70 square feet (6.5 m) shall have a minimum door leaf width of 24 inches (610 mm).

8. The minimum clear opening width shall not apply to doors for nonaccessible showers or sauna compartments.

9. The minimum clear opening width shall not apply to the doors for nonaccessible toilet stalls.

10. ~~Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.~~ Door closers, overhead door stops, frame stops, power door operators, and electromagnetic door locks shall be permitted to project into the door opening height not lower than 78 inches (1980 mm) above the floor.

1104.8 ~~Opening force for doors~~ Forces to unlatch and open doors. ~~The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. The opening forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding 30 pounds (133 N). The door shall swing to a full-open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.~~ Forces required to unlatch and open doors shall be in accordance with Sections 1104.8.1 and 1104.8.2.

1104.8.1 Unlatching doors. The forces to unlatch doors shall comply with the following:

1. Where door hardware operates by push or pull, the operational force to unlatch the door shall not exceed 15 pounds (67 N).
2. Where door hardware operates by rotation, the operational force to unlatch the door shall not exceed 28 inch-pounds (3.164 N-m).

1104.8.2 Opening doors. The forces to open doors shall comply with the following:

1. For interior swinging egress doors that are manually operated, other than doors required to be fire rated, the force for pushing or pulling open the door shall not exceed 5 pounds (22 N).
2. For other swinging doors, sliding doors, or folding doors, and doors required to be fire-rated, the door shall require not more than a 30-pound (133 N) force to be set in motion and shall move to a full-open position when subjected to not more than a 15-pound (67 N) force.

~~**[BE] 1104.16.7 Maintenance.** Fire escape stairways shall be kept clear and unobstructed at all times and shall be maintained in good working order.~~

~~**[BE] 1104.16.5.1 Examination.** Fire escape stairways and balconies shall be examined for structural adequacy and safety in accordance with Section 1104.16.5 by a registered design professional or others acceptable to the fire code official every 5 years, or as required by the fire code official. An inspection report shall be submitted to the fire code official after such examination.~~

[NY]TABLE 1104.18 COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

OCCUPANCY	COMMON PATH OF EGRESS TRAVEL LIMIT		DEAD-END LIMIT		EGRESS ACCESS TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)[j]	Unsprinklered (feet)	Sprinklered (feet)

Group A	75	~~20/~~75[i]	20[a]	20[a]	200	250[i]
Group B[h]	75[g]	100[i]	50	50	200	300[i]
Group E	75	75[i]	20	50	200	250[i]
Group F-1, S-1	75[g]	100[j]	50	50	200[c]	250[c, h, j]
Group F-2, S-2	75[g]	100[j]	50	50	300	400[l]
Group H-1	25	25[l]	0	0	75	75[j, l]
Group H-2	50	100[l]	0	0	75	100[j, l]
Group H-3	50	100[l]	20	20	100	150[j, l]
Group H-4	75	75[l]	20	20	150	175[j, l]
Group H-5	75	75[l]	20	50	150	200[j]
Group I-1	75	75[j]	20	50	200	250[i]
Group I-2	Notes d, e, f	Notes d, e, f, j	Note e	Note e	150	200[b, j]
Group I-3	100	100[i]	NR	NR	150[b]	200[b, j]
Group I-4	NR	NR	20	20	200	250[j]
Group M	75	100[i]	50	50	200	250[i, j]
Group R-1	75	75[j, k]	50	50	200	250[j, k]
Group R-2	75	125[j, k]	50	50	200	250[j, k]
Group R-3	NR	NR	NR	NR	NR	NR
Group R-4	NR	NR	NR	NR	NR	NR
Group U	75[g]	100[i]	20	50	300	400[i]

NR = No Requirements.

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

a. See Section 1029.9.5 for dead-end aisles in Group A occupancies.

b. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.

c. See Section 412.7 of the International Building Code for special requirements on spacing of doors in aircraft hangars.

d. Separation of exit access doors within a care recipient sleeping room, or any suite that includes care recipient sleeping rooms, shall comply with Section 1105.5.6.

e. In smoke compartments containing care recipient sleeping rooms and treatment rooms, dead-end corridors shall comply with Section 1105.5.5.

f. In Group I-2, Condition 2, care recipient sleeping rooms or any suite that includes care recipient sleeping rooms shall comply with Section 1105.6.

g. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet.

h. Where the building, or portion of the building, is limited to one story and the height from the finished floor to the bottom of the ceiling or roof slab or deck is 24 feet or more, the exit access travel distance is increased to 400 feet.

i. For covered and open malls, the exit access travel distance is increased to 400 feet.

j. Buildings equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1

k. Buildings equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.2

l. Group H occupancies equipped with an approved automatic sprinkler system in accordance with Section 903.2.5

~~[NY]~~ TABLE 1105.4 INCIDENTAL USES IN EXISTING GROUP I-2 OCCUPANCIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	2 hours
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops not classified as Group H	2 hours; or 1 hour and provide automatic sprinkler system
Laboratories and vocational shops, not classified as Group H	1 hour or provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
Patient rooms equipped with padded surfaces	1 hour or provide automatic sprinkler system

Physical plant maintenance shops	1 hour or provide automatic sprinkler system
Waste and linen collection rooms with containers with total volume of 10cubic feet or greater	1 hour or provide automatic sprinkler system
Storage rooms greater than 100 square feet	1 hour or provide automatic sprinkler system
~~*Energy storage systems* having an energy capacity greater than the threshold quantity in Table 1206.1 of this code.~~ Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterruptable power supplies	2 hours

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

1105.5.4.2.2 Corridor doors. Doors in corridor walls shall limit the transfer of smoke by complying with the following:

1. Doors shall be constructed of not less than 1¾ inch-thick (44 mm) solid bonded-core wood or capable of resisting fire not less than ⅓ hour.

Exception: Corridor doors in buildings equipped throughout with an automatic sprinkler system.

2. Frames for side-hinged swinging doors shall have stops on the sides and top to limit transfer of smoke.
3. Where provided, vision panels in doors shall be a fixed glass window assembly installed to limit the passage of smoke. Existing wired glass panels with steel frames shall be permitted to remain in place.
4. ~~Door undercuts~~ The clearance between the bottom of the door and floor shall not exceed 1 inch (25 mm).
5. Doors shall be positive latching with devices that resist not less than 5 pounds (22.2 N). Roller latches are prohibited.
6. Mail slots or similar openings shall be permitted in accordance with Section 1105.5.4.3.

1105.5.4.2.4 Self- or automatic-closing doors. Where self- or automatic-closing doors are required, closers shall be maintained in operational condition. Hold open devices on doors shall be capable of manual release.

1105.5.4.2.5 Protective plates. Protective plates installed on corridor doors shall not be limited in size.

1105.6.1 Two means of egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated. Smoke compartments that do not contain an exit shall be provided with direct access to not less than two adjacent smoke compartments.

SECTION 1107 ENERGY STORAGE SYSTEMS

1107.1 Lithium-ion technology energy storage systems. The owner of an energy storage system (ESS) utilizing lithium-ion battery technology having capacities exceeding the values in Table 1207.1.3 and that was installed prior to the jurisdiction's adoption of the 2018 or later edition of the *International Fire Code* shall provide the *fire code official* a failure modes and effects analysis (FMEA) or other *approved* hazard mitigation analysis in accordance with Section 104.2.2 for review and approval.

Exception: *Detached one- and two-family dwellings* and *townhouses*.

1107.1.1 Early detection. In addition to the requirements of Section 1207.1.8.1 and 1207.1.8.2, the analysis shall include an assessment of the ability of the installed protection systems to provide for early detection and notification of a thermal runaway event in relation to the ability of emergency responders to safely mitigate the size and impact of a thermal runaway event.

1107.1.2 Corrective action plan. Where hazards are identified by the analysis, a plan that includes a timetable for corrective action shall be submitted to the *fire code official* for review and approval. The plan shall include actions and system improvements necessary for eliminating or mitigating any identified hazards, including listed methods for early detection and notification of a thermal runaway event.

CHAPTER 12 ENERGY SYSTEMS

~~[NY]~~**1201.1 Scope.** The provisions of this chapter shall apply to the installation, operation, and maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy, including but not limited to energy storage systems under the exclusive control of an electric utility or lawfully designated agency. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency. Energy storage systems regulated by Section 1207 shall comply with this chapter, as appropriate, and NFPA 855.

1201.2 Electrical wiring and equipment. Electrical wiring and equipment used in connection with energy systems shall be installed and maintained in accordance with Chapter 12, Section 603 and NFPA 70.

~~[NY]~~**1201.3 Mixed system installation.** Where mixed systems are *approved* ~~by the fire code official~~, the aggregate nameplate kWh energy of all *energy storage systems* in a *fire area* shall not exceed the maximum quantity specified for any of the energy systems in this chapter. Where required by the ~~authority having jurisdiction~~ fire code official, a hazard mitigation analysis shall be provided and *approved* in accordance with Section 104.2.2 to evaluate any potential adverse interaction between the various energy systems and technologies.

~~[NY]~~**1202.1Definitions.**

The following terms are defined in Chapter 2:

BATTERY SYSTEM, STATIONARY STORAGE.

BATTERY TYPES.

CAPACITOR ENERGY STORAGE SYSTEM.

CRITICAL CIRCUIT.

EMERGENCY POWER SYSTEM.

ENERGY STORAGE MANAGEMENT SYSTEMS.

ENERGY STORAGE SYSTEM (ESS).

ENERGY STORAGE SYSTEM CABINET.

ENERGY STORAGE SYSTEM COMMISSIONING.

ENERGY STORAGE SYSTEM DECOMMISSIONING.

ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.

ENERGY STORAGE SYSTEM, MOBILE.

~~WALK-IN~~ ENERGY STORAGE SYSTEM, WALK-IN UNIT.

FUEL CELL POWER SYSTEM, STATIONARY.

STANDBY POWER SYSTEM.

PORTABLE GENERATOR.

[NY] 1203.1 General. Emergency power systems and standby power systems required by this code or the *Building Code of New York State* shall comply with Sections 1203.1.1 through ~~1203.1.9~~. 1203.1.10.

1203.1.2 Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be separated from areas of the building other than the room the generator is located in by ~~an approved method, or~~ one of the following methods:

1.A fire-resistant pipe-protection system that has been tested in accordance with UL 1489. The system shall be installed as tested and in accordance with the manufacturer's installation instructions, and shall have a rating of not less than 2 hours. Where the building is protected throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1, the required rating shall be reduced to 1 hour.

2. An assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

3.Other *approved* methods.

[NY] 1203.1.10 Energy storage systems for emergency and standby power. *Energy storage systems* providing emergency or standby power shall be listed in accordance with UL9540 and comply with this Chapter.

Exception: Lead-acid battery systems in uninterruptable power supplies shall comply with Section 1207, be listed and labeled in accordance with UL 1778 and utilized for standby power applications.

1203.2.3 Emergency responder ~~radio~~ communication coverage systems. Standby power shall be provided for in-building 2-way emergency responder ~~radio~~ communication coverage systems as required in Section 510.4.2.3. The standby power supply shall be capable of operating the in-building 2-way emergency responder communication coverage system at 100-percent system operation capacity for a duration of not less than 12 hours.

1203.2.4 Emergency voice/alarm communication systems. ~~Emergency~~ Standby power shall be provided for emergency voice/alarm communication systems ~~as required~~ in accordance with ~~Section 907.5.2.2.5. The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in~~ NFPA 72.

~~[NY]~~1203.2.5 Exhaust ventilation. Standby power shall be provided for mechanical exhaust ventilation systems as required in Section 1206.6.1.2.1. The system shall be capable of powering the required load for a duration of not less than two hours.

~~[NY]~~1203.2.6 Exit signs.

Emergency power shall be provided for exit signs as required in Section 1013.6.3. The system shall be capable of powering the required load for a duration of not less than 90 minutes.

~~[NY]~~1203.2.7~~6~~ Gas detection systems. Emergency power shall be provided for gas detection systems where required by Sections 1203.2.~~9~~10 and ~~1203.2.16. Standby~~ 1203.2.17. Standby power shall be provided for gas detection systems where required by ~~Section 916.5.~~ Sections 916.5 and 1207.6.1.2.4.

~~[NY]~~1203.2.8 Group I-2 occupancies.

Essential electrical systems for Group I-2 occupancies shall be in accordance with Section 407.11 of the *Building Code of New York State*.

~~[NY]~~1203.2.9 Group I-3 occupancies.

Power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies shall be operable by a manual release mechanism at the door. Emergency power shall be provided for the doors and locks.

Exceptions:

1. Emergency power is not required in facilities where provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required as set forth in the *Building Code of New York State*.
2. Emergency power is not required where remote mechanical operating releases are provided.

~~[NY]~~1203.2.10 Hazardous materials.

Emergency and standby power shall be provided in occupancies with hazardous materials as required in the following sections:

1. Sections 5004.7 and 5005.1.5 for hazardous materials.
2. Sections 6004.2.2.8 and 6004.3.4.2 for highly toxic and toxic gases.
3. Section 6204.1.11 for organic peroxides.

~~[NY]~~1203.2.11 High-rise buildings.

Standby power and emergency power shall be provided for high-rise buildings as required in Section 403 of the *Building Code of New York State*, and shall be in accordance with Section 1203.

~~[NY]~~1203.2.12 Special purpose horizontal sliding doors.

Standby power shall be provided for horizontal sliding doors as required in Section 1010.~~1.4~~3.3. The standby power supply shall have a capacity to operate not fewer than 50 closing cycles of the door.

~~[NY]~~1203.2.13 Hydrogen fuel gas rooms.

Standby power shall be provided for hydrogen fuel gas rooms as required by Section 5808.7.

~~[NY]~~1203.2.14 Laboratory suites.

Standby or emergency power shall be provided in accordance with Section 5004.7 where *laboratory suites* are located above the sixth story above grade plane or located in a story below grade plane.

~~[NY]~~1203.2.15 Means of egress illumination.

Emergency power shall be provided for *means of egress* illumination in accordance with Sections 1008.3 and 1104.5.1.

~~[NY]~~1203.2.16 Membrane structures.

Standby power shall be provided for auxiliary inflation systems in permanent membrane structures in accordance with Section 2702 of the *Building Code of New York State*. Auxiliary inflation systems shall be provided in temporary air-supported and air-inflated membrane structures in accordance with Section 3103.~~10~~9.4.

~~[NY]~~1203.2.17 Semiconductor fabrication facilities.

Emergency power shall be provided for semiconductor fabrication facilities as required in Section 2703.15.

[~~NY~~] 1203.2.18 Smoke control systems. Standby power shall be provided for smoke control systems as required in Section 909.11.

[~~NY~~] 1203.2.19 Underground buildings. Emergency and standby power shall be provided in underground buildings as required in Section 405 of the *Building Code of New York State* and shall be in accordance with Section 1203.

1203.4.1 Group I-2 and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, emergency and standby power systems shall be maintained in accordance with NFPA 99.

1203.5.1 Group I-2 and ambulatory care facilities. In Group I-2 occupancies and ambulatory care facilities, emergency and standby power systems shall be inspected and tested under load in accordance with NFPA 99.

SECTION 1204 PORTABLE GENERATORS

1204.1 Portable generators. The use, operation, and maintenance of portable generators shall comply with this section.

1204.2 Listing. Portable generators manufactured after January 1, 2021 shall be *listed* and *labeled* in accordance with the UL 2201.

1204.3 Operation and maintenance. Portable generators shall be operated and maintained in accordance with the manufacturer's instructions.

1204.4 Grounding. Portable generators shall be grounded in accordance with NFPA 70.

1204.5 Operating locations. Portable generators shall be operated only outdoors a minimum of 5 feet (1524 mm) from any building openings such as windows and doors or air intakes. Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31.

1204.6 Cords and wiring. Extension cords and temporary wiring used to connect portable generators shall be in accordance with Section 603 and shall be provided with GFCI protection.

1204.7 Connections to premise wiring. Connections to a premise wiring system shall comply with all of the following:

1.Power shall not be provided in a manner that "back feeds" receptacles or the premise wiring system.

2.Connection to a premise served by commercial power shall be made through a *listed* transfer switch installed, used and maintained in accordance with NFPA 70.

3.Connections to buildings not served by commercial power shall comply with NFPA 70.

1204.8 Refueling. Portable generators shall not be refueled while operating.

1204.9 Storage and repair. Storage and repair of fuel fired portable generators shall comply with Section 313.

1204.10 Fire extinguisher. A *listed* portable fire extinguisher complying with Section 906 with a minimum rating of 2-A:20-B:C shall be provided not more than 50 feet (15240 mm) from the portable generator.

SECTION ~~1204~~ 1205 SOLAR PHOTOVOLTAIC POWER SYSTEMS

~~**1204.1**~~ **1205.1 General.** Solar photovoltaic (PV) systems shall be installed in accordance with ~~Sections 1204.2 through 1204.5, and~~ the International Building Code or International Residential Code. The electrical portion of solar PV systems shall be installed in accordance with NFPA 70. Rooftop-mounted solar photovoltaic systems shall be installed in accordance with Sections 1205.2 through 1205.4.3. Ground-mounted solar photovoltaic systems shall comply with Section 1205.5.

~~**1204.2**~~**1205.2 Access and pathways.** Roof access, pathways, and spacing requirements shall be provided in accordance with Sections ~~1204.2.1~~ 1205.2.1 through ~~1204.3.3~~ 1205.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

Exceptions:

1.Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises and similar structures.

2.Roof access, pathways and spacing requirements need not be provided where the fire code official has determined that rooftop operations will not be employed.

3. Building-integrated photovoltaic (BIPV) systems where the BIPV systems are *approved*, integrated into the finished roof surface and are *listed* in accordance with UL 3741.The removal or cutting away of portions of the BIPV system during fire-fighting operations shall not expose a fire fighter to electrical shock hazards.

~~1204.2.1~~ 1205.2.1 **Solar photovoltaic (PV) systems for Group R-3 buildings.** Solar photovoltaic (PV) systems for Group R-3 buildings shall comply with Sections 120~~4~~5.2.1.1 through ~~1204.2.1.3.~~1205.2.3.

Exceptions:

1. These requirements shall not apply to structures designed and constructed in accordance with the International Residential Code.
2. These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal or less.

1205.2.3 Building-integrated photovoltaic (BIPV) systems. Where building-integrated photovoltaic (BIPV) systems are installed in a manner that creates areas with electrical hazards to be hidden from view, markings shall be provided to identify the hazardous areas to avoid for ladder placement. The markings shall be reflective and be visible from grade beneath the eaves or other location *approved* by *the fire code official*.

Exception: BIPV systems *listed* in accordance with UL 3741, where the removal or cutting away of portions of the BIPV system during fire-fighting operations have been determined to not expose a fire fighter to electrical shock hazards.

~~1204.3.3~~ 1205.3.3 **Smoke ventilation.** The solar installation shall be designed to meet the following requirements:

1.Where nongravity-operated smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide shall be provided bordering all sides.

2.~~Smoke ventilation options between array sections shall be one of the following:~~

~~2.1.A pathway not less than 8 feet (2438 mm) wide.~~

~~2.2.~~Where gravity-operated dropout smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide on not fewer than one side.

3.Smoke ventilation options between array sections shall be one of the following:

3.1.A pathway not less than 8 feet (2438 mm) wide.

3.2.A pathway not less than 4 feet (1219 mm) wide bordering 4-foot by 8-foot (1219 mm by 2438 mm) venting cutouts every 20 feet (6096 mm) on alternating sides of the pathway.

~~1204.4~~ 1205.5 **Ground-mounted photovoltaic panel systems.** Ground-mounted photovoltaic panel systems shall ~~comply~~ be installed in accordance with ~~Section 1204.1 and~~ this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. ~~A clear, brush-free area of 10 feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.~~

1205.5.1 Vegetation control. A clear, brush-free area of 10 feet (3048 mm) shall be required around the perimeter of ground-mounted photovoltaic arrays. A maintained vegetative surface or a non-combustible base *approved* by the *fire code official* shall be installed and maintained under the photovoltaic arrays and associated electrical equipment installations.

~~1205.1~~ 1206.1 **General.** *Stationary fuel cell power systems* in new and existing occupancies shall comply with this section.

Exception: The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1206.13

~~[ ]~~ 120~~5~~6.2 **Permits.** Permits shall be obtained for stationary fuel cell power systems as set forth in Section 105.~~2~~6.10.

[NY]120~~5~~6.3Equipment.

Stationary fuel cell power systems shall comply with the following:

1. *Prepackaged fuel cell power systems* shall be listed and labeled in accordance with CSA FC 1.
2. The modules and components in a *preengineered fuel cell power system* shall be listed and labeled in accordance with CSA FC 1 and interconnected to complete the assembly of the system at the job site in accordance with the manufacturer's instructions and the module and component listings.

3. *Field-fabricated fuel cell power systems* shall be approved based on a review of the technical report. ~~provided in accordance with Section 104.8.2.~~ The report shall be prepared by and bear the stamp of a registered design professional and shall include:

   3.1. A fire risk evaluation.

   3.2. An evaluation demonstrating that modules and components in the fuel cell power system comply with applicable requirements in CSA FC 1.

   3.3. Documentation of the fuel cell power system's compliance with applicable NFPA 2 and NFPA 853 construction requirements.

~~1206.5~~ 1206.5 **Residential use.** *Stationary fuel cell power systems* shall not be installed in Group R-3 and R-4 buildings, or *dwelling units* associated with Group R-2 buildings unless they are specifically *listed* for residential use.

> **Exception:** The temporary use of a fuel cell-powered electric vehicle to power a Group R-3 or R-4 building while parked shall comply with Section 1206.13.

120~~5~~6.6 **Indoor installations.** *Stationary fuel cell power systems* installed in indoor locations shall comply with Sections 120~~5~~6.6 through 120~~5~~6.6.2. For purposes of this section, an indoor location includes a roof and 50 percent or greater enclosing walls.

~~1206.13~~ 1206.6.3 **Gas detection systems.** *Stationary fuel cell power systems* shall be provided with a gas detection system. Detection shall be provided in *approved* locations in the fuel cell power system enclosure, the exhaust system or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

~~1206.13.1~~ 1206.6.3.1 **System activation.** The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
3. Initiate local audible and visible alarms in *approved* locations.

~~1205.12~~1206.12 **Fire ~~suppression.~~ protection.** Fire ~~suppression~~ protection systems for stationary fuel cell power system installations shall be provided in accordance with NFPA 853.

1206.13 Group R-3 and R-4 fuel cell vehicle energy storage system use. The temporary use of the *dwelling unit owner* or occupant's fuel cell-powered electric vehicle to power a Group R-3 or R-4 dwelling while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and NFPA 70.

SECTION 120~~6~~7

ELECTRICAL ENERGY STORAGE SYSTEMS (ESS)

1207.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

> **Exception:** ESS in Group R-3 and R-4 occupancies shall only be required to comply with Section 1207.11 except where Section 1207.11.4 requires compliance with Sections 1207.1 through 1207.9.

1207.1.1 Utilities and Industrial applications. This section shall not apply to capacitors and capacitor equipment for electric utilities and industrial facilities used in applications such as flexible AC transmission (FACTS) devices, filter capacitor banks, power factor correction, and standalone capacitor banks for voltage correction and stabilization. (Material based on NFPA 855 2023 Ed.)

1207.1.2 Mobile ESS. Mobile ESS deployed at an electric utility substation or generation facility for 90 days or less shall not add to the threshold values in Table 1207.1.3. for the stationary ESS installation if both of the following conditions apply:

1. The mobile ESS complies with Section 1207.10.

2. The mobile ESS is being used during periods in which the facility's stationary ESS is being tested, repaired, retrofitted or replaced

(Material based on NFPA 855 2023 Ed.)

[NY] **1206~~6~~7.1.3 Scope.** ~~Energy storage systems~~ ESS having capacities exceeding the values shown in Table ~~1206.1~~ 1207.1.3 shall comply with this section ~~1206.2 through 1206.17.7.7~~. ~~Energy storage systems in Group R-3 and R-4 occupancies shall comply with Section 1206.18.~~ (Material based on NFPA 855 2023 Ed.)

[NY] ~~TABLE 1206.1~~ TABLE 1207.1.3 ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES

TECHNOLOGY	ENERGY CAPACITY[a]
Capacitor ESS	3 kWh
Flow batteries[b]	20 kWh
Lead-acid batteries, all types	70 kWh[c]
Lithium-ion batteries	20 kWh
~~Nickel metal hydride (Ni-MH)~~	~~70 kWh (252 Megajoules)~~
Nickel-cadmium batteries (Ni-Cd), nickel metal hydride (Ni-MH), and nickel zinc (Ni-Zn) batteries	70 kWh
Non-electrochemical ESS[d]	70 kWh
Other battery technologies	10 kWh
Other electrochemical ESS technologies	3 kWh
Sodium nickel chloride batteries	70 kWh
Zinc manganese dioxide batteries (Zn-MnO2)	70 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

c. ~~An installation that exceeds 50 gallons of lead-acid battery electrolyte shall be considered to have exceeded the threshold quantities of this Table.~~ Fifty gallons of lead-acid battery electrolyte shall be considered equivalent to 70 kWh.

d. Covers nonelectrochemical technologies such as flywheel and thermal ESS

~~[NY] 1206.2 Applicability.~~ ~~The provisions of Section 1206 shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of both stationary energy storage systems and mobile energy storage systems.~~

~~Exceptions:~~

~~1. Equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility.~~

~~2. Outdoor stationary vehicle charging stations with a capacity of 250 kWh or less. Electrical connections between the charging station and buildings shall meet the requirements of NFPA 70.~~

~~**[NY] 1206.2.1 Electrical wiring and equipment.** Electrical wiring and equipment used in connection with *energy storage systems* shall be installed and maintained in accordance with this chapter and NFPA 70.~~

~~**[NY] 1206.2.2 Mixed system installation.** Where *approved* by the *fire code official*, the aggregate nameplate kWh energy capacity of all *energy storage systems* in a fire area shall not exceed the maximum quantity specified for any of the *energy storage systems* in this chapter. Where required by the *authority having jurisdiction*, a hazard mitigation analysis shall be provided and *approved* to evaluate any potential adverse interaction between the various *energy storage systems* and technologies.~~

1207.1.4.1 Communication utilities. Operating permits shall not be required for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 voltage alternating current (VAC) and 60 voltage direct current (VDC).

[NY] ~~**1206.4**~~ **1207.1.5 Construction documents**. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly *fire-resistance* ratings of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and *deflagration* venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with Section 1207.2.1.
10. A decommissioning plan complying with Section 1207.2.3.
11. Peer reviewer identification and qualifications~~, where required by the authority having jurisdiction~~
12. A fire safety and evacuation plan in accordance with Section 404.

1207.1.5.1 Utilities applicability. Plans and specifications associated with ESS owned and operated by electric utilities as a component of the electric grid that are considered critical infrastructure documents in accordance with the provisions of the North American Electric Reliability Corporation and other applicable governmental laws and regulations shall be made available to the *fire code official* for viewing based on the requirements of the applicable governmental laws and regulations. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.5**~~**1207.1.6 Hazard mitigation analysis.** A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.2.2 under any of the following conditions:

1. Where ESS technologies not specifically identified in Table ~~1206.1~~ 1207.1.3 are provided.
2. More than one ESS technology is provided in a ~~room or enclosed~~ single fire area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities. See Section ~~1206.12.2~~ 1207.5.2.
4. Where required by the *fire code official* to address a potential hazard with an ESS installation that is not addressed by existing requirements.

~~**[NY] 1206.5.1**~~ **1207.1.6.1 Fault condition.** The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single electrochemical ESS ~~rack, module or~~ unit.
2. A mechanical failure of a non-electrochemical ESS unit.

~~2.~~ 3. Failure of any battery (energy) ~~storage~~ management system or fire protection system within the ESS equipment that is not covered by the product listing failure mode effects analysis (FMEA).

~~3.~~4. Failure of any required protection system external to the ESS, including but not limited to ventilation ~~or~~ (HVAC), exhaust ventilation, smoke detection, fire detection, gas detection or fire suppression system. (Material based on NFPA 855 2023 Ed.)

~~4. Voltage surges on the primary electric supply.~~

~~5. Short circuits on the load side of the ESS.~~

~~6. Failure of the smoke detection, fire detection, fire suppression or gas detection system.~~

~~7. Required spill neutralization not being provided or failure of a required secondary containment system.~~

~~[NY] 1206.5.2~~ **1207.1.6.2 Analysis approval.** The *fire code official* ~~may~~ is authorized to approve the hazardous mitigation analysis provided that the consequences of the hazard mitigation analysis demonstrate:

1. Fires will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance-rated ~~assemblies~~ separations identified in Section ~~1206.14.4~~ 1207.7.4.

2. Fires involving the ESS will allow occupants or the general public to evacuate to a safe location. (Material based on NFPA 855 2023 Ed.) ~~in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.~~

~~3. Toxic and highly toxic gases released during fires will not reach concentrations in excess of the IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate occupants from any affected area.~~

~~4. Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).~~

~~5. Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases, preventing accumulation, or by deflagration venting.~~

~~[NY] 1206.5.3~~ **1207.1.6.3 Additional protection measures**. Construction, equipment and systems that are required for the ESS to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section ~~1206~~ 1207 shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.6~~ **1207.1.7 Large-scale fire test**. Where required elsewhere in Section ~~1206~~ 1207, large-scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A ~~or approved equivalent~~. The testing shall be conducted or witnessed and reported by an approved testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas and walk-in units will be contained ~~In addition, the testing shall demonstrate that, where the energy storage system is installed~~ within a room, enclosed area or *walk-in* ~~energy storage system~~ *unit* for the duration of the test~~., a fire will be contained within the room, enclosed area or walk-in energy storage system unit for a duration equal to the fire-resistance rating of the room assemblies as specified in Section 1206.14.4.~~ The test report shall be provided to the fire code official for review and approval in accordance with Section 104.2.2. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.7~~ **1207.1.8 Fire remediation.** Where a fire or other event has damaged the ESS and ignition or re-ignition of the ESS is possible, the system owner, agent, or lessee shall take~~, at their expense, comply with Sections 1206.7.1 and 1206.7.2,~~ the following actions, at their expense, to mitigate the hazard or remove damaged equipment from the premises to a safe location.

[NY] ~~**1206.7.1 Fire mitigation**~~ **1207.1.8.1 Hazard Support personnel.** ~~Where, required by in the opinion of the fire code official, it is essential for public safety that trained personnel be on-site to respond to possible ignition or re-ignition of a damaged ESS~~ The system owner, agent or lessee shall ~~at their expense, immediately~~ dispatch within 15 minutes one or more ~~fire mitigation~~hazard support personnel to the premise, and arrive within 4 hours, as required and approved, at their expense. These personnel shall remain on duty continuously after the fire department leaves the premise until the damaged energy storage equipment is removed from the premises, or earlier if the fire code official indicates the public safety hazard has been abated. (Material based on NFPA 855 2023 Ed.)

[NY] ~~**1206.7.2**~~ **1207.1.8.2 Duties.** On-duty ~~fire mitigation~~ hazard support personnel shall have the following responsibilities:

1. Keep diligent watch for fires, obstructions to means of egress and other hazards.

2. Immediately contact the fire department if their assistance is needed to mitigate any hazards or extinguish fires.

3. Take prompt measures for remediation of hazards in accordance with the decommissioning plan in Section ~~1206.9.3~~ 1207.2.3.

4.Take prompt measures to assist in the evacuation of the public from the structures. (Material based on NFPA 855 2023 Ed.)

[NY]1207.1.8.3 Qualifications. The hazard support personnel shall meet the following requirements

1. Be trained in operations associated with the design, operation and special hazards of energy storage systems at the facility.
2. Be knowledgeable in the following site specific plans.
    a. Fire safety plan prepared in compliance with Section 403;
    b. Pre-incident plan prepared in accordance with Section 1207.13;,
    c. Emergency operations plan prepared in accordance with Section 4.3.2.1 of NFPA 855; and
    d. HMA prepared in accordance with Section 4.4 of NFPA 855
3. Completed the following classes:
    a. ICS-100, Introduction to the Incident Command System, 2018;
    b. IS-200: Basic Incident Command System for Initial Response, ICS-200; and
    c. IS-700, An Introduction to the National Incident Management System, 2018

~~**[NY] 1206.8 Peer review.** Where required by the *authority having jurisdiction*, the owner or the owner's authorized agent shall be responsible for retaining and furnishing the services of a *registered design professional* or special expert, who will perform as a peer reviewer, subject to the *approval* of the *fire code official*.~~

~~**[NY] 1206.8.1 Costs.** The costs of special services, where required by the *authority having jurisdiction*, shall be borne by the owner or the owner's authorized agent.~~

~~**[NY] 1206.8.2 Special expert.** Where the scope of work is limited or focused in an area that does not require the services of a *registered design professional* or the special knowledge and skills associated with the practice of architecture or engineering, an *approved* special expert may be employed by the owner or the owner's authorized agent as the person in responsible charge of the limited or focused activity.~~

~~**[NY] 1206.8.2.1 Scope of work.** The scope of work of a special expert shall be limited to the area of expertise as demonstrated in the documentation submitted to the *fire code official* for review and *approval*.~~

~~**[NY] 1206.8.2.2 Special expert qualifications**. Special experts are those individuals who possess the following qualifications:~~

~~1. Has credentials of education and experience in an area of practice that is needed to evaluate risks and safe operations associated with the design, operation and special hazards of *energy storage systems*.~~

~~2. Licensing or registration, when required by any other applicable statute, regulation, or local law or ordinance.~~

~~**[NY] 1206.9** 1207.2 **Commissioning, decommissioning, operation and maintenance.** Commissioning, decommissioning, operation and maintenance shall be conducted in accordance with this section.~~

~~**[NY] 1206.9.1** 1207.2.1 **Commissioning.** ~~Energy storage system~~ Commissioning of newly installed ESS and existing ESS that have been retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been *approved* prior to initiating commissioning. The commissioning plan shall include the following:~~

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities.

2. A listing of the specific ESS and associated components, controls and safety-related devices to be tested, a description of the tests to be performed and the functions to be tested.

3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.

4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.

5. Verification that required equipment and systems are installed in accordance with the *approved* plans and specifications.

6. Integrated testing for all fire and safety systems.

7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.

8. Preparation and delivery of operation and maintenance documentation.

9. Training of facility operating and maintenance staff.

10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.

11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.

12. A decommissioning plan ~~in accordance with Section 1206.9.3.~~ for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the *fire code official* prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

Exceptions:

1. ~~Energy storage system~~ Commissioning shall not be required for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. ~~However~~ A decommissioning plan shall be provided and maintained where required by the ~~authority having jurisdiction.~~ *fire code official*.

2. Lead-acid and nickel-cadmium battery systems less than 50 VAC, 60 VDC that are in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities and located outdoors or in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76, shall be permitted to have a commissioning plan in compliance with recognized industry practices in lieu of complying with Section 1207.2.1.

3. Lead-acid and nickel-cadmium battery systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utilities, and located in building spaces or walk-in units used exclusively for such installations, shall be permitted to have a commissioning plan in compliance with applicable governmental laws and regulations in lieu of developing a commissioning plan in accordance with Section 1207.2.1. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.9.1.1**~~ **1207.2.1.1 Initial acceptance testing.** During the commissioning process an ESS shall be evaluated for proper operation in accordance with the manufacturer's instructions and the commissioning plan prior to final approval.

~~**[NY] 1206.9.1.2**~~ **1207.2.1.2 Commissioning report.** A report describing the results of the system commissioning and including the results of the initial acceptance testing required in Section ~~1206.9.1.1~~ 1207.2.1.1 shall be provided to code official prior to final inspection and approval and maintained at an approved on-site location. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.9.2~~ 1207.2.2 **Operation and maintenance**. An operation and maintenance manual shall be provided to both the ESS *owner* or their authorized agent and the ESS operator before the ESS is put into operation and ~~The energy storage system shall be operated and maintained in accordance with the manual. A copy of the manual shall be retained at an approved onsite location and be available to the fire code official. The O&M~~ shall include the following:

1. Manufacturer's operation manuals and maintenance manuals for the entire ESS, or for each component of the system requiring maintenance, that clearly identify the required routine maintenance actions.

2. Name, address and phone number of a service agency that has been contracted to service the ESS and its associated safety systems.

3. Maintenance and calibration information, including wiring diagrams, control drawings, schematics, system programming instructions and control sequence descriptions, for all energy storage control systems.

4. Desired or field-determined control set points that are permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.

5. A schedule for inspecting and recalibrating all ESS controls.

6. A service record log form that lists the schedule for all required servicing and maintenance actions and space for logging such actions that are completed over time and retained on-site.

~~7. Inspection and testing records shall be maintained in the O&M.~~

The ESS shall be operated and maintained in accordance with the manual and a copy of the manual shall be retained at an approved on-site location and be available to the fire code official.

~~**[NY] 1206.9.2.1 Systems monitoring.**~~**1207.2.2.1 Ongoing inspection and testing.** Systems that monitor and protect the ESS installation shall be inspected and tested in accordance with the manufacturer's instructions and ~~Section 1206.9.2.~~ the operating and maintenance manual. Inspection and testing records shall be maintained in the operation and maintenance manual.

~~**[NY] 1206.9.3**~~ **1207.2.3 Decommissioning.** The ~~authority having jurisdiction~~ code official shall be notified prior to decommissioning of an ESS. Decommissioning ~~or removal of the energy storage system from service, and from the facility in which it is located, shall be performed in accordance with the decommissioning plan. The plan shall include details on providing a safe and orderly shutdown of the energy storage system~~ shall be performed in accordance with the decommissioning plan that includes the following:

1.A narrative description of the activities to be accomplished for removing the ESS from service, and from the facility in which it is located.

2.A listing of any contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.10**~~ **1207.3 Equipment.** ESS equipment shall be in accordance with Sections ~~1206.10.1~~ 1207.3.1 through ~~1206.10.9~~ 1207.3.9.

[NY] ~~**1206.10.1**~~ **1207.3.1 Energy storage system listings.** ESS shall be *listed* in accordance with UL 9540 ~~or approved equivalent~~**.**

Exceptions: ~~**Lead** acid and nickel-cadmium battery systems installed in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76 are not required to be listed.~~

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC, 60 VDC in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations that are in compliance with NFPA 76.

2. Lead-acid and nickel-cadmium battery systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

3. Lead-acid battery systems in uninterruptable power supplies listed and *labeled* in accordance with UL 1778 and utilized for standby power applications.

4 Lead-acid and nickel-cadmium battery systems that are used exclusively for fixed guideway transit or passenger rail systems for either the operation of rolling stock or for signaling and communication equipment, and are located outdoors or in building spaces used exclusively for such installations.

(Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.10.2**~~ **1207.3.2 Equipment listing.** Chargers, inverters, energy storage management systems shall be covered as part of the UL 9540 listing or shall be listed separately.

~~**[NY] 1206.10.3**~~ **1207.3.3 Utility interactive systems.** Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

~~**[NY] 1206.10.4**~~ **1207.3.4 Energy storage management system.** Where required by the ESS listing an approved energy storage management system shall be provided that monitors and balances cell voltages, currents and temperatures within the manufacturer's specifications. The system shall disconnect electrical connections to the ESS or otherwise place it in a safe condition if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected. (Material based on NFPA 855 2023 Ed.)

[NY] 1207.3.4.1 Monitoring of energy storage management system and reporting. Electrochemical ESS exceeding the maximum allowable quantities in Table 1207.5 shall be continuously monitored at a continuously attended monitoring station, by trained and knowledgeable persons trained by the manufacturer or installer of the battery system. The monitoring facility shall, without delay, make the following notifications in the event ESS exceeds or appears likely to exceed thresholds at which fire, explosion, or other serious adverse consequences may result:

1. Notify the Local Fire Department though the emergency dispatch system.
2. Notify the *fire code official* to alert the *authority having jurisdiction* of the unsafe condition.
3. Notify the *Hazard Support Personal* to alert such individual to be ready to provide technical assistance to the and/or respond to the incident location in accordance with Section 1207.1.8.1.
4. Notify the manufacturer of the battery system to make a qualified representative available to provide technical assistance to the responding hazard mitigation personnel, *fire code official* and fire chief.

[NY] 1207.3.4.1.1 Remote monitoring of energy storage management system and reporting. Where the owner of an ESS complies with Section 1207.3.4.1 with a remote monitoring system, such remote monitoring shall arrange for data transmissions from the battery system's energy storage management system to a continuously attended remote monitoring facility staffed by trained and knowledgeable persons retained by the manufacturer or installer of the battery system. The remote monitoring facility shall make the notification required by Section 1207.3.4.1.

~~**[NY] 1206.10.5**~~ **1207.3.5 Enclosures.** Enclosures of ESS shall be of noncombustible construction.

~~**[NY] 1206.10.6**~~ **1207.3.6 Repairs.** Repairs of ESS shall only be done by qualified personnel. Repairs with other than identical parts shall be considered retrofitting and comply with Section ~~1206.10.7~~ 1207.3.7. Repairs shall be documented in the service records log. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.10.7**~~ **1207.3.7 Retrofits.** Retrofitting of an existing ESS shall comply with the following:

1.A construction ~~building~~ permit shall be obtained in accordance with Section 105.

2.New batteries, battery modules, capacitors and similar ESS components shall be listed

3.Battery ~~Energy storage~~ management and other monitoring systems shall be connected and installed in accordance with the manufacturer's instructions.

4.The overall installation shall continue to comply with UL 9540 listing requirements, where applicable.

5.Systems that have been retrofitted shall be commissioned in accordance with Section 1206.2.1.

6.Retrofits shall be documented in the service records log. (Material based on NFPA 855 2023 Ed.)

~~**Exception:** Retrofitting of lead-acid and nickel-cadmium batteries with other lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.~~

[NY 1207.3.7.1 Retrofitting lead acid and nickel cadmium. Changing out or retrofitting of lead-acid and nickel-cadmium batteries with other lead-acid and nickel-cadmium batteries in the following applications shall be considered repairs where there is no increase in system size or energy capacity greater than 10 percent of the original design.

1. At facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

2. Battery systems used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

3. Batteries in uninterruptible power supplies *listed* and *labeled* in accordance with UL 1778 and used for standby power applications only.

4. Lead-acid and nickel-cadmium battery systems that are used exclusively for fixed guideway transit or passenger rail systems for either the operation of rolling stock or for signaling and communication equipment, and are located outdoors or in building spaces used exclusively for such installations

(Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.10.8**~~ **1207.3.8 Replacements.** Replacements of ESS shall be considered new ESS installations and shall comply with the provisions of Section 1207~~1206~~ as applicable to new ESS. The ESS being replaced shall be decommissioned in accordance with Section ~~1206.9.3~~1207.2.3.

~~**[NY] 1206.10.9**~~ **1207.3.9 Reused and repurposed equipment.** Equipment and materials shall only be reused or reinstalled as ~~approved by the fire code official~~ permitted in Section 104.9.1. Storage batteries previously used in other applications, such as electric vehicle propulsion, shall not be reused in ~~other~~ applications ~~such as electric vehicle propulsion~~, regulated by ~~this~~ Chapter 12, unless ~~(1)~~ approved by the fire code official and ~~(2)~~ unless the equipment is refurbished by a battery refurbishing company approved in accordance with UL 1974. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.11**~~ **1207.4 General installations requirements.** Stationary and mobile ESS shall comply with the requirements of sections ~~1206.11.1 through 1206.11.12.~~ 1206.4.1 through 1206.4.12.

~~**[NY] 1206.11.1**~~ **1207.4.1 Electrical disconnects.** Where the ESS disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

Exception: Electrical disconnects for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC shall be permitted to have electrical disconnects signage in accordance with NFPA 76.

~~**[NY] 1206.11.2**~~ **1207.4.2 Working clearances.** Access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with NFPA 70 and the manufacturer's instructions.

~~**[NY] 1206.11.3**~~ **1207.4.3 Fire-resistance rated separations.** Rooms and other indoor areas containing ESS shall be separated from other areas of the building in accordance with Section 1206.7.4. ESS shall be permitted to be in the same room with the equipment they support.

~~**[NY] 1206.11.4**~~ **1207.4.4 Seismic and structural design.** Stationary ESS shall comply with the seismic design requirements in Chapter 16 of the International Building Code, and shall not exceed the floor loading limitation of the building.

~~**[NY] 1206.11.5**~~ **1207.4.5 Vehicle impact protection.** Where ESS are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312 ~~of this code~~.

~~**[NY] 1206.11.6**~~ **1207.4.6 Combustible storage.** Combustible materials shall not be stored in ESS rooms, areas, or walk-in ~~energy storage system~~ units. Combustible materials in occupied work centers covered by Section 120~~6~~7.4.10 shall be stored at least 3 feet (914 mm) from ESS cabinets.

~~**[NY] 1206.11.7**~~ **1207.4.7 Toxic and highly toxic gases.** ESS that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall be provided with a hazardous exhaust system in accordance with Section 502.8 of the Mechanical Code of New York State.

~~[NY] 1206.11.8~~ 1207.4.8 **Signage.** Approved signs shall be provided on or adjacent to all entry doors for ESS rooms or areas and on enclosures of ESS cabinets and walk-in units located outdoors, on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent.

1.“ENERGY STORAGE SYSTEM”, “BATTERY STORAGE SYSTEM”, “CAPACITOR ENERGY STORAGE SYSTEM”, or the equivalent.

2.The identification of the electrochemical ESS technology present.

3.“ENERGIZED ELECTRICAL CIRCUITS”

4.If water reactive electrochemical ESS are present the signage shall include “APPLY NO WATER”

5.Current contact information, including phone number, for personnel authorized to service the equipment and for fire mitigation personnel required by Section ~~1206.1.7.1.~~ 1207.1.8.1

6. Relevant hazard warnings, map of the site, ESS enclosures, and associated equipment and isolation distances response personnel should maintain from ESS involved in fire or where there may be a risk of explosion or deflagration

Exception: Where the electrochemical ESS system is deemed to be “critical infrastructure” in accordance with federal and state laws, rules, and regulations, all sensitive information shall be placed in a key box, that complies with Section 506, provided that all other information is provided as described above.

7. Identification of multiple power sources

Exception: Where the electrochemical ESS system is deemed to be “critical infrastructure” in accordance with federal and state laws, rules, and regulations, all sensitive information shall be placed in a key box that complies with Section 506, provided that all other information is provided as described above.

Exception: Existing electrochemical ESS shall be permitted to include the signage required at the time they were installed. (Material based on NFPA 855 2023 Ed.)

[NY]1207.4.8 .1 Sign features. *Approved* signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 24 inches (610 mm).

2. The letters providing warnings identified in items 1, 3, and 4 of Section 1207.4.8 shall be not less than 5 inches (127 mm) in height.

3. The number designating all other required information shall be not less than 1 inch (25 mm) in height.

4. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.

~~[NY] 1206.11.9~~ 1207.4.9 **Security of installations.** Rooms, areas and walk-in units in which electrochemical ESS are located shall be secured against unauthorized entry and safeguarded in an approved manner. Security barriers, fences, landscaping, and other enclosures shall not inhibit the required air flow to or exhaust from the electrochemical ESS and its components. (Material based on NFPA 855 2023 Ed.)

[NY] 1207.4.9.1 Video monitoring. For all electrochemical ESS that exceed the amounts in Table 1207.5, the system shall be monitored by a video surveillance system complying with Chapter 7 of NFPA 731 and the following:

1. A minimum look back period of 72 hours shall be available.
2. In the case of an incident, the video surveillance shall be made available to the Fire Department and the *Fire Code Official* for viewing.

~~[NY] 1206.11.10~~ 1207 .4.10 **Occupied work centers.** Electrochemical ESS located in rooms or areas occupied by personnel not directly involved with maintenance, service and testing of the systems shall comply with the following.

1. Electrochemical ESS located in occupied work centers shall be housed in locked noncombustible cabinets or other enclosures to prevent access by unauthorized personnel.
2. Where electrochemical ESS are contained in cabinets in occupied work centers, the cabinets shall be located within 10 feet (3048 mm) of the equipment that they support.
3. Cabinets shall include signage complying with Section ~~1206.11.8~~ 1207.4.8. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.11.11**~~ **1207.4.11 Open rack installations.** Where electrochemical ESS are installed in a separate equipment room and only authorized personnel have access to the room, they shall be permitted to be installed on an open rack for ease of maintenance. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.11.12**~~ **1207.4.12 Walk-in units.** Walk-in units shall only be entered for inspection, maintenance and repair of ESS units and ancillary equipment, and shall not be occupied for other purposes.

~~**[NY] 1206.12**~~ **1207.5 Electrochemical ESS protection.** The protection of electrochemical ESS shall be in accordance with Sections 1207.5.1 through 1207.5.8 where required by Sections 1207.7 through 1207.10. (Material based on NFPA 855 2023 Ed.)

~~**[NY] TABLE 1206.12**~~ **TABLE 1207.5**

MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS

TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES [a]
STORAGE BATTERIES	
Flow batteries[b]	600 kWh
Lead-acid, all types	Unlimited
Lithium-ion	600 kWh
Nickel-cadmium (Ni-Cd), Nickel metal hydride (NI-MH) and nickel zinc (Ni-Zn)	Unlimited
Sodium nickel chloride	600kWh
Zinc Manganese dioxide (Zn-MnO2)	Unlimited
Other battery technologies	200 kWh
CAPACITORS	
All types	20 kWh
OTHER ELECTROCHEMICAL ESS	
All types	20 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For electrochemical ESS units rated in amp-hours, kWh shall equal rated voltage times the amp-hour rating divided by 1,000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide and other flowing electrolyte-type technologies.

~~1206.12.1~~ 1207.5.1 **Size and separation.** Electrochemical ESS shall be segregated into groups not exceeding 50 kWh (180 megajoules). Each group shall be separated a minimum of 3 feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10 ~~of this code~~.

1. Lead-acid and nickel-cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.

2. Lead-acid and nickel cadmium systems that are, used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

3. Lead-acid battery systems in uninterruptable power supplies *listed* and *labeled* in accordance with UL 1778, utilized for standby power applications, and limited to not more than 10 percent of the floor area on the floor on which the ESS is located.

~~2.~~4. The *fire code official* is authorized to approve larger capacities or smaller separation distances ~~shall be permitted~~ based on large-scale fire testing complying with Section ~~1206.6~~1207.1.5.

~~[NY] 1206.12.2~~ 1207.5.2 **Maximum allowable quantities.** Fire areas within rooms, areas and walk-in units containing electrochemical ESS shall not exceed the maximum allowable quantities in Table 1207.5 ~~1206.5~~.

Exceptions: (Material based on NFPA 855 2023 Ed.)

1. Where approved by the fire code official, rooms, areas and walk-in units containing electrochemical ESS that exceed the amounts in Table ~~1206.12~~ 1207.5 shall be permitted based on a hazardous mitigation analysis in accordance with Section 1207.1.6 ~~1206.5~~ and large-scale fire testing complying with Section 1207.1.7~~1206.6~~.
2. Lead-acid and nickel cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
3. Dedicated use buildings in compliance with Section ~~1206.14.1~~ 1207.7.1.

~~[NY] 1206.12.2.1~~ 1207.5.2.1 **Mixed electrochemical energy systems.** Where rooms, areas and walk-in energy storage system units contain different types of electrochemical energy technologies, the total aggregate quantities of the systems shall be determined based on the sum of percentages of each technology type quantity divided by the maximum allowable quantity of each technology type. The sum of the percentages shall not exceed 100 percent of the maximum allowable quantity.

~~[NY] 1206.12.3~~ 1207.5.3 **Elevation.** Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

2. Where the floor is located below the lowest *level of exit discharge*.

Exceptions:

1. Lead-acid and nickel-cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.

2. Lead-acid and nickel cadmium systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations.

3. Lead-acid battery systems in uninterruptable power supplies *listed* and *labeled* in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10 percent of the floor area on the floor on which the ESS is located.

~~2~~4. Where *approved*, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.

~~3~~5. Where *approved* by the *fire code official*, installations shall be permitted on higher and lower floors~~, based on large scale fire testing complying with Section 1206.6 or on hazard mitigation analysis complying with Section 1206.5~~.

~~**[NY] 1206.12.4**~~ **1207.5.4 Fire detection.** An *approved* automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas and walk-in units containing electrochemical ESS. An *approved* radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where *approved* to a constantly attended location.

Exception: Normally unoccupied, remote stand-alone telecommunications structures with a gross floor area of less than 1500 ft (139 m^2) utilizing lead-acid or nickel-cadmium batteries shall not be required to have a fire detection system installed. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.12.4.1**~~ **1207.5.4.1 System status.** Lead-acid and nickel-cadmium battery systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations, shall be allowed to use the process control system to monitor the smoke or radiant energy–sensing fire detectors required in Section 1207.5.4. (Material based on NFPA 855 2023 Ed.)

~~Where required by the authority having jurisdiction, visible annunciation shall be provided on cabinet exteriors or in other approved locations to indicate that potentially hazardous conditions associated with the energy storage system exist.~~

[NY] 1207.5.4.2 Alarm criteria. In accordance with the manufacturer's instructions and the design professional's specifications for the ESS, alarm activation criteria shall be set to minimize non-emergency alarm activations for all fire detection, gas detection, or other emergency alarm system sensors.

[NY] ~~**1206.12.5**~~ **1207.5.5 Fire suppression systems.** Rooms and areas within buildings and walk-in ~~energy storage system~~ units containing electrochemical ~~energy storage systems~~ ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. ~~An~~ Automatic sprinkler system~~s~~, designed and installed in accordance with Section 903.3.1.1 for ESS units (groups) with a maximum stored energy capacity of 50 kWh, as described in Section 1207.5.1, shall be designed with a minimum density of 0.3 gpm/ft (1.14 L/min) based ~~on the fire area~~ over the area of the room or 2500 square feet (232 m^2) design area, whichever is smaller, unless a lower density is approved based upon large-scale fire testing in accordance with Section 1207.1.7.

2. ~~Where approved, based on large scale fire testing complying with Section 1206.6, an~~ Aautomatic sprinkler systems designed and installed in accordance with Section 903.3.1.1 ~~with a sprinkler hazard classification~~ for ESS units (groups) exceeding 50 kWh shall use a density based on large-scale fire testing complying with Section 1207.1.7.

3. ~~Where approved, based on large scale fire testing complying with Section 1206.6,~~ The following ~~alternate~~ alternative automatic fire-extinguishing systems designed and installed in accordance with Section 904, provided that the installation is *approved* by the *fire code official* based on large-scale fire testing complying with Section 1207.1.7:

   3.1. NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems.*

   3.2. NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection.*

   3.3. NFPA 750, *Standard on Water Mist Fire Protection Systems.*

   3.4. NFPA 2001, *Standard on Clean Agent Fire-Extinguishing Systems.*

   3.5. NFPA 2010, *Standard for Fixed Aerosol Fire-Extinguishing Systems.*

~~**Exception**~~ **Exceptions:**

1. Fire suppression systems for lead-acid and nickel-cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.

2. Lead-acid and nickel-cadmium systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations, shall not be required to have a fire suppression system installed.

3. Lead-acid battery systems in uninterruptable power supplies *listed* and *labeled* in accordance with UL 1778, utilized for standby power applications, which is limited to not more than 10 percent of the floor area on the floor on which the ESS is located, shall not be required to have a fire suppression system. (Material based on NFPA 855 2023 Ed.)

4. Lead-acid and nickel-cadmium battery systems that are used exclusively for fixed guideway transit or passenger rail systems for either the operation of rolling stock or for signaling and communication equipment, and are located outdoors or in building spaces used exclusively for such installations.

~~[NY] 1206.12.5.1~~ 1207.5.5.1 Water reactive systems. ~~Where an e~~Electrochemical ~~energy storage system~~ ESS that utilize~~s~~ water-reactive materials ~~is approved based on largescale fire testing complying with Section 1206.6, it~~ shall be protected by an approved alternative automatic fire extinguishing system in accordance with Section 904, where the installation is *approved* by the *fire code official* based on large-scale fire testing complying with Section 1207.1.7..

~~[NY] 1206.12.6~~ 1206.5.6 Maximum enclosure size. Outdoor walk-in ~~energy storage system~~ units housing ESS shall not exceed ~~4,028 cubic feet (114 m^3),~~ 53 feet by 8 feet by 9.5 feet high, (16154 mm x 2438 mm x 2896 mm), not including bolt-on HVAC and related equipment, as approved. Outdoor walk-in ~~energy storage system~~ units exceeding these limitations shall be considered indoor installations and comply with the requirements in Section 1207.7~~1206.14~~. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.12.7~~ 1207.5.7 Vegetation control. Areas within 10 feet (3 m) on each side of an outdoor ~~energy storage system~~ ESS shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground cover~~s~~ shall be permitted to be exempt, provided that they do not form a means of readily transmitting fire. (Material based on NFPA 855 2023 Ed.)

> ~~**Exception:** A reduced clearance to combustible vegetation shall be permitted based on large scale fire testing complying with Section 1206.6.~~

~~[NY] 1206.12.8~~ 1207.5.8 Means of egress separation. ~~Energy storage systems~~ ESS located outdoors and in open parking garages shall be separated from any means of egress as required by the *fire code official* to ensure safe egress under fire conditions, but in no case ~~by no~~ less than 10 feet (3048 mm).

> **Exception:** The fire code official ~~may~~ is authorized to approve a reduced separation distance if large scale fire testing complying with Section ~~1206.6~~ 1207.1.7 is provided that shows that a fire involving the ~~energy storage system~~ ESS will not adversely impact occupant egress. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.13~~ 1207.6 Electrochemical ESS technology specific protection. Electrochemical ESS installations shall comply with the requirements of this section in accordance with the applicable requirements of Table 1207.6 ~~1206.13~~. (Material based on NFPA 855 2023 Ed.)

~~[NY]~~ TABLE ~~1206.13~~ 1207.6 ELECTROCHEMICAL ESS TECHNOLOGY-SPECIFIC REQUIREMENTS

COMPLIANCE REQUIRED[b]		BATTERY TECHNOLOGY						OTHER ESS AND BATTERY TECHNOLOGIES[b]	CAPACITOR ESS[b]
Feature	Section	Lead-acid	Nickel cadmium (Ni-Cd), nickel metal hydride (Ni-MH) and nickel zinc (Ni-Zn)	Zinc Manganese dioxide (Zn MnO2)	Lithium-ion	Flow	Sodium nickel chloride		

Exhaust ventilation	~~1206.13.1~~ 1207.6.1	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Explosion control	~~1206.13.3~~ 1207.6.3	Yes[ag]	Yes[ag]	Yes	Yes	No	Yes	Yes	Yes
Safety caps	~~1206.13.4~~ 1207.6.4	Yes	Yes	No	No	No	No	Yes	Yes
Spill control and neutralization	~~1206.13.2~~ 1207.6.2	Yes[c]	Yes[c]	Yes[f]	No	Yes	No	Yes	Yes
Thermal runaway	~~1206.13.5~~ 1207.6.5	Yes[d]	Yes	Yes[e]	Yes[e]	No	Yes	Yes[e]	Yes

a. Not required for lead-acid and nickel-cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.2.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented-type (i.e., flooded) nickel-cadmium and lead-acid batteries.

d. Not required for vented-type (i.e., flooded) ~~lead-acid~~ batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

f. Not required for batteries with jelled electrolyte.

g. Not required for lead-acid and nickel-cadmium battery systems that are used exclusively for fixed guideway transit or passenger rail systems for either the operation of rolling stock or for signaling and communication equipment, and are located outdoors or in building spaces used exclusively for such installations.

~~[NY] 1206.13.1~~ 1207.6.1 Exhaust ventilation. Where required by Table ~~1206.13~~1207.6 or elsewhere in this code, exhaust ventilation of rooms, areas, and walk-in units containing electrochemical ESS shall be provided in accordance with the International Mechanical Code and Section 1207.6.1.1 or 1207.6.1.2. ~~1206.13.1.1 or 1206.13.1.2~~

~~[NY] 1206.13.1.1~~ 1207.6.1.1 Ventilation based upon LFL. The exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area, or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.

~~[NY] 1206.13.1.2~~ 1207.6.1.2 Ventilation based upon exhaust rate. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 $ft^3/min/ft^2$(5.1 $L/sec/m^2$) of floor area of the room, area, or walk-in unit. The ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 1207.6.1.2.4. ~~1206.13.1.2.4~~

~~[NY] 1206.13.1.2.1~~ 1207.6.1.2.1 Standby power. Mechanical exhaust ventilation shall be provided with a minimum of two hours of standby power in accordance with Section 1203.2.5 ~~604.2.17~~.

~~[NY] 1206.13.1.2.2~~ 1207.6.1.2.2 Installation instructions. Required mechanical exhaust ventilation systems shall be installed in accordance with the manufacturer's installation instructions and the Mechanical Code of New York State.

[NY] 1206.13.1.2.3 1207.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised by an approved supervising central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible signal at an *approved* constantly attended on-site location.

[NY] 1206.13.1.2.4 1207.6.1.2.4 Gas detection system. Where required by Section 1206.13.1.2 1207.6.1.2, rooms, areas, and walk-in units containing ESS shall be protected by an approved continuous gas detection system that complies with Section 916 and with the following:

1.The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area, or walk-in unit exceeds 25 percent of the LFL.

2.The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.

3.The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.6.

4.Failure of the gas detection system shall annunciate a trouble signal at an approved central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible trouble signal at an approved constantly attended on-site location. (Material based on NFPA 855 2023 Ed.)

[NY] 1206.13.2 1207.6.2 Spill control and neutralization. Where required by Table 1207.6 1206.13 or elsewhere in this code, areas containing free-flowing liquid electrolyte or hazardous materials shall be provided with spill control and neutralization in accordance with this section. (Material based on NFPA 855 2023 Ed.)

[NY] 1206.13.2.1 1207.6.2.1 Spill control. Spill control shall be provided to prevent the flow of liquid electrolyte or hazardous materials to adjoining rooms or areas. The method shall be capable of containing a spill from the single largest battery or vessel. (Material based on NFPA 855 2023 Ed.)

[NY] 1206.13.2.2 1207.6.2.2 Neutralization. An approved method to that is capable of neutralizeing spilled liquid electrolyte shall be provided that is capable of neutralizing a spill from the largest battery or vessel to a pH between 5.0 and 9.0 shall be provided. (Material based on NFPA 855 2023 Ed.)

[NY] 1206.13.2.3 1207.6.2.3 Communication Utilities. The requirements of Section 1206.13.2 1207.6.2 shall only apply when the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) for lead acid and nickel cadmium battery systems operating at less than 50 VAC and 60 VDC that are located at facilities under the exclusive control of communications utilities and those facilities comply with NFPA 76 in addition to applicable requirements of this code.

[NY] 1206.13.3 1207.6.3 Explosion control. Where required by Table 1207.6 1206.13 or elsewhere in this code, explosion control complying with Section 911 shall be provided for rooms, areas, ESS cabinets or ESS walk-in energy storage system units containing electrochemical ESS technologies.

Exceptions: (Material based on NFPA 855 2023 Ed.)

1. Where approved, by the fire code official, explosion control may is permitted to be waived by the *fire code official* based on large-scale fire testing complying with Section 1206.61207.1.7 that demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules.
2. Where *approved*, by the fire code official, explosion control may is permitted to be waived by the *fire code official* based on documentation provided in accordance with Section 104.2.2 that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in energy storage system unit or structure under thermal runaway or other fault conditions.
3. Where *approved*, ESS cabinets that have no debris, shrapnel, or enclosure pieces ejected during large scale fire testing complying with Section 1207.1.5 shall be permitted in lieu of providing explosion control complying with Section 911.
4. Explosion control is not required for lead-acid and nickel cadmium battery systems less than 50 VAC, 60 VDC in telecommunication facilities under the exclusive control of communications utilities located in building spaces or walk-in units used exclusively for such installations.
5. Explosion control is not required for lead-acid and nickel cadmium systems used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control

of the electric utility, located in building spaces or walk-in units used exclusively for such installations.

6. Explosion control is not required for lead-acid battery systems in uninterruptable power supplies *listed* and *labeled* in accordance with UL 1778, utilized for standby power applications, and housed in a single cabinet in a single *fire area* in buildings or walk-in units.

7. Lead-acid and nickel-cadmium battery systems that are used exclusively for fixed guideway transit or passenger rail systems for either the operation of rolling stock or for signaling and communication equipment, and are located outdoors or in building spaces used exclusively for such installations.

[NY] 1207.6.3.1 Explosion warning sign. Where explosion control panels are provided, warning signs shall be posted conspicuously with the following requirements:

1. A sign stating "Explosion Panel Stay Clear", or other approved warning language, shall be posted adjacent to the panel or on the panel, in accordance with the manufacturer's instructions.
2. The sign shall be at least 24 inches(410 mm) by 18 inches (457 mm) nominally
3. Lettering shall be at least 4 inches (100 mm) high.
4. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.

~~**[NY] 1206.13.4**~~ **1207.6.4 Safety caps.** Where required by Table 1207.6 ~~1206.13~~ or elsewhere in this code, vented batteries and other ESS shall be provided with flame-arresting safety caps.

~~**[NY] 1206.13.5**~~ **1207.6.5 Thermal runaway.** Where required by Table 1207.6 ~~1206.13~~ or elsewhere in this code, batteries and other ESS shall be provided with a listed device or other approved method to prevent, detect and minimize the impact of thermal runaway.

~~**[NY] 1206.14**~~ **1207.7 Indoor installations.** Indoor ESS installations shall be in accordance with Sections 1207.7.1 through 1207.7.4 ~~1206.14.1 through 1206.14.4.~~ (Material based on NFPA 855 2023 Ed.)

~~**[NY] TABLE 1206.14**~~ **TABLE 1207.7 INDOOR ESS INSTALLATIONS**

COMPLIANCE REQUIRED		DEDICATED USE BUILDINGS [a]	NON-DEDICATED USE BUILDINGS [b]
Feature	**Section**		
~~1206.14.3~~ Dwelling units and sleeping units	1207.7.3	NA	Yes
~~1206.12.3~~ Elevation	1207.5.3	Yes	Yes
~~1206.12.5~~ Fire suppression systems	1207.5.5	Yes ~~[d]~~[c]	Yes
~~1206.14.4~~ Fire-resistance rated separations	1207.7.4	Yes	Yes
~~1206.11~~ General installation requirements	1207.4	Yes	Yes
~~1206.12.2~~ Maximum allowable quantities	1207.5.2	No	Yes
~~1206.12.1~~ Size and separation	1207.5.1	Yes	Yes

~~1206.12.4~~ Smoke and automatic fire detection	1207.5.4	Yes[ed]	Yes
~~1206.13~~ Technology specific protection	1207.6	Yes	Yes

NA = Not allowed.

a. See Section ~~1206.14.1~~ 1207.7.1.

b. See Section ~~1206.14.2~~ 1207.7.2.

~~d~~c. Where approved by the fire code official, fire suppression systems are permitted to be omitted in dedicated use buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

~~e~~d. Where approved by the fire code official, alarm signals are not required to be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or a constantly attended location where local fire alarm annunciation is provided and trained personnel are always present.

~~[NY] 1206.14.1~~ 1207.7.1 Dedicated use buildings. For the purpose of Table 1207.7, dedicated use ESS buildings ~~in compliance with this section~~ shall be classified as Group F-1 occupancies and ~~For the purpose of Table 1206.14, dedicated use energy storage system buildings shall~~ comply with all the following:

1.The building shall only be used for ESS, electrical energy generation, and other electrical grid related operations.

2~~3~~.Occupants in the rooms and areas containing ESS are limited to personnel that operate, maintain, service, test and repair the ESS and other energy systems.

3~~2~~.No other occupancy types shall ~~not~~ be permitted in the building.

4.Administrative and support personnel shall be permitted in areas within the buildings that do not contain ESS, provided:

4.1. The areas do not occupy more than 10 percent of the building area of the story in which they are located.

4.2. A *means of egress* is provided from the ~~administrative and support~~ incidental use areas to the public way that does not require occupants to traverse through areas containing ESS or other energy system equipment. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.14.2~~ 1207.7.2 Non-dedicated use buildings. For the purpose of Table ~~1206.14~~ 1207.7 non-dedicated use buildings include all buildings that contain ESS and do not comply with Section ~~1206.14.1~~ 1207.7.1 dedicated use building requirements. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.14.3~~ 1207.7.3 Dwelling units and sleeping units. ESS shall not be installed in sleeping units or in habitable spaces of dwelling units. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.14.4~~ 1207.7.4 Fire-resistance ~~rating~~ rated separations. ~~Separation shall be provided by 2 hour rated fire barriers constructed in accordance with Section 707 of the Building Code of New York State and 2 hour rated horizontal assemblies constructed in accordance with Section 711 of the Building Code of New York State, as appropriate~~. Rooms and areas containing ESS shall ~~be protected on the system side~~ include *fire-resistance rated* separations as follows:

1.In dedicated use buildings, ~~fire-resistance rated assemblies shall be provided between~~ rooms and areas containing ESS ~~and~~ shall be separated from areas in which administrative and support personnel are located.

2.In non-dedicated use buildings, ~~fire-resistance rated assemblies shall be provided between~~ rooms and areas containing ESS ~~and~~ shall be separated from other areas in the building.

Separation shall be provided by 2 hour *fire barriers* constructed in accordance with Section 707 of the *Building Code of New York State* and 2 hour horizontal assemblies constructed in accordance with Section 711 of the *Building Code of New York State*, as appropriate. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.15~~ **1207.8 Outdoor installations.** Outdoor installations shall be in accordance with Sections ~~1206.15.1~~ 1207.8.1 through 1207.8.3 ~~1206.15.3~~. Exterior wall installations for individual ESS units not exceeding 20 kWh shall be in accordance with Section 1206.8.4. ~~Sections 1206.15.3 and 1206.15.4~~. (Material based on NFPA 855 2023 Ed.)

~~[NY] TABLE 1206.15~~ **TABLE 1207.8 OUTDOOR ESS INSTALLATIONS** [a]

COMPLIANCE REQUIRED		REMOTE INSTALLATIONS [a]	INSTALLATIONS NEAR EXPOSURES [b]
Feature	**Section**		
~~1206.11 General installation requirements~~ All ESS installations	1207.4	Yes	Yes
~~1206.15.3~~ Clearance to exposures	1207.8.3	Yes	Yes
~~1206.16.5~~ Fire suppression systems	1207.5.5	Yes ~~d~~c	Yes
~~1206.12.2~~ Maximum allowable quantities	1207.5.2	No	Yes
~~1206.12.6~~ Maximum enclosure size	1207.5.6	Yes	Yes
~~1206.12.8~~ Means of egress separation	1207.5.8	Yes	Yes
~~1206.12.1~~ Size and separation	1207.5.1	No	Yes ~~e~~d
~~1206.12.4~~ Smoke and automatic fire detection	1207.5.4	Yes	Yes
~~1206.13~~ Technology specific protection	1207.6	Yes	Yes
~~1206.12.7~~ Vegetation control	1207.5.7	Yes	Yes

a. See Section ~~1206.15.1~~ 1207.8.1.

b. See Section ~~1206.15.2~~ 1207.8.2.

~~d~~c. Where approved by the fire code official, fire suppression systems are permitted to be omitted.

~~e~~d. In outdoor walk-in ~~energy storage system~~ units, spacing is not required between ESS units and the walls of the enclosure.

~~[NY] 1206.15.1~~ **1207.8.1 Remote outdoor installations.** For the purpose of Table 1207.8 ~~1206.15~~, remote outdoor installations include ESS located more than 100 feet (30488 mm) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

~~[NY] 1206.15.2~~ **1207.8.2 Installations near exposures.** For the purpose of Table 1207.8~~1206.15~~, installations near exposures include all outdoor ESS installations that do not comply with Section 1207.8.1 ~~1206.15.1~~ remote outdoor location requirements. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.15.3~~ **1207.8.3 Clearance to exposures.** ESS located outdoors shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Lot lines.

2. Public ways.

3. Buildings.

4. Stored combustible materials.

5. Hazardous materials

6. High-piled ~~storage~~ stock.

7. Other exposure hazards.

Exceptions: (Material based on NFPA 855 2023 Ed.)

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour free standing fire barrier, suitable for exterior use, and extending 5 feet (11524 mm) above and 5 feet (1524 mm) ~~horizontally~~ beyond the physical boundary of the ESS installation is provided to protect the exposure.

2. Clearances to buildings are permitted to be reduced to 3 feet (914 mm) where noncombustible exterior walls with~~out~~ no openings or combustible overhangs are provided on the wall adjacent to the ESS and the fire-resistance rating of the exterior wall is ~~no less than~~ a minimum of 2 hours.

3. Clearances to buildings are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS, and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section ~~1206.6~~ 1207.1.7.

~~4.Where exterior wall installations in accordance with Section 1206.15.4 are provided, the clearance between the energy storage system and the wall in which it is mounted, is permitted to be reduced to zero.~~

~~**[NY] 1206.15.4**~~ **1207.8.4 Exterior wall installations.** ESS shall be permitted to be installed outdoors on exterior walls of buildings when all of the following conditions are met:

1.The maximum energy capacity of individual ESS units shall not exceed 20 kWh.

2.The ESS shall comply with applicable requirements in Section ~~1206.15~~ 1207.

3.The ESS shall be installed in accordance with the manufacturer's instructions and their listing.

4.Individual ESS units shall be separated from each other by at least three feet (914 mm).

5.The ESS shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least five feet (1524 mm).

Exception: Where approved smaller separation distances in items 4 and 5 shall be permitted based on large scale fire testing complying with Section 1207.1.7. (Material based on NFPA 855 2023 Ed.)

~~**[NY] 1206.16**~~ **1207.9 Special installations.** Rooftop and open parking garage ESS installations shall comply with Sections ~~1206.16.1~~ 1207.9.1 through ~~1206.16.6~~ 1207.9.6.

~~**[NY] TABLE 1206.16**~~ **TABLE 1207.9 SPECIAL ESS INSTALLATIONS**

COMPLIANCE REQUIRED		ROOFTOPS [a]	OPEN PARKING GARAGES [b]
Feature	Section		
~~1206.11 General installation requirements~~ All ESS installations	1207.4	Yes	Yes
~~1206.16.3~~ Clearance to exposures	1207.9.3	Yes	Yes

~~1206.16.4~~ Fire suppression systems	1207.9.4	Yes	Yes
~~1206.12.2~~ Maximum allowable quantities	1207.5.2	Yes	Yes
~~1206.12.6~~ Maximum enclosure size	1207.5.6	Yes	Yes
~~1206.12.8~~ Means of egress separation	1207.5.8	Yes	Yes
~~1206.16.6~~ Open parking garage installations	1207.9.6	No	Yes
~~1206.16.5~~ Rooftop installations	1207.9.5	Yes	No
~~1206.12.1~~ Size and separation	1207.5.1	Yes	Yes
~~1206.12.4~~ Smoke and automatic fire detection	1207.5.4	Yes	Yes
~~1206.13~~ Technology specific protection	1207.6	Yes	Yes

a. See Section ~~1206.16.1~~ 1207.9.1.

b. See Section ~~1206.16.2~~ 1207.9.2.

~~[NY] 1206.16.~~1 1207.9.1 Rooftop installations. For the purpose of Table ~~1206.16~~ 1207.9, rooftop ESS installations are those located on the roofs of buildings. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.16.2~~ 1207.9.2 Open parking garage installations. For the purpose of Table ~~1206.16~~ 1207.9, open parking garage ESS installations are those located in a structure or portion of a structure that complies with Section 406.5 of the *Building Code of New York State*. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.16.3~~ 1207.9.3 Clearance to exposures. ESS located on rooftops and in open parking garages shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1.Buildings, except the building on which rooftop ESS is mounted

2.Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed

3.Lot lines

4.Public ways

5.Stored combustible materials

6.Locations where motor vehicles can be parked

7.Hazardous materials

8.Other exposure hazards

Exceptions:

1.Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and ~~extending~~ 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.

2.Clearances are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section ~~1206.6~~ 1207.1.7. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.16.4~~ 1207.9.4 **Fire suppression systems.** ESS located in walk-in ~~energy storage system~~ units on rooftops or in walk-in ~~energy storage system~~ units in open parking garages shall be provided with automatic fire suppression systems within the ESS enclosure in accordance with Section ~~1206.12.5~~ 1207.5.5. Areas containing ESS other than walk-in ~~energy storage system~~ units in open parking structures on levels not open above to the sky shall be provided with an automatic fire suppression system complying with Section 1207.5.5.

Exception: A fire suppression system is not required in open parking garages if large scale fire testing complying with Section ~~1206.6~~ 1207.1.7 is provided that shows that a fire will not impact the exposures in Section ~~1206.16.3~~ 1207.9.3. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.16.5~~ 1207.9.5 **Rooftop installations.** ESS and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1.Stairway access to the roof for emergency response and fire department personnel shall be provided either through a bulkhead from the interior of the building or a stairway on the exterior of the building.

2.Service walkways at least 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.

3.ESS and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment, or component but not less than 5 feet (1.5 m).

4.The roofing materials under and within 5 feet (1524 mm) horizontally from an ESS or associated equipment shall be noncombustible or shall have a Class A rating when tested in accordance with ASTM E108 or UL 790.

5.A Class I standpipe outlet shall be installed at an approved location on the roof level of the building or in the stairway bulkhead at the top level.

6.The ESS shall be the minimum of 10 feet from the fire service access point on the roof top. (Material based on NFPA 855 2023 Ed.)

~~**Exception:** This distance shall be permitted to be reduced to 25 feet (7620 mm) if the automatic fire alarm system monitoring the radiant-energy sensing detectors deenergizes the ventilation system connected to the air intakes upon detection of fire.~~

~~[NY] 1206.16.6~~ 1207.9.6 **Open parking garages.** ESS and associated equipment that are located in open parking garages shall comply with all of the following:

1.ESS shall not be located within 50 feet (15,240 mm) of air inlets for building HVAC systems.

Exception: This distance shall be permitted to be reduced to 25 feet (7.620 mm) if the automatic fire alarm system monitoring the radiant-energy sensing detectors de-energizes the ventilation system connected to the air intakes upon detection of fire.

2.ESS shall not be located within 25 feet (7620 mm) of exits leading from the attached building where located on a covered level of the parking structure not directly open to the sky above.

3.An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of the ESS. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17~~ 1207.10 **Mobile ESS equipment and operations.** Mobile ESS equipment and operations shall comply with Sections ~~1206.17.1 through 1206.17.7.7~~ 1207.10.1 through 1207.10.7.7. (Material based on NFPA 855 2023 Ed.)

TABLE 1207.10 ~~1206.17~~ BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.

COMPLIANCE REQUIRED		DEPLOYMENT
Feature	Section	

~~1206.11 General installation requirements~~ All ESS installations	1207.4	Yes [b]
~~1206.12.5~~ Fire suppression systems	1207.5.5	Yes ~~[d]~~[c]
~~1206.12.2~~ Maximum allowable quantities	1207.5.2	Yes
~~1206.12.6~~ Maximum enclosure size	1207.5.6	Yes
~~1206.12.8~~ Means of egress separation	1207.5.8	Yes
~~1206.12.1~~ Size and separation	1207.5.1	Yes ~~[e]~~[d]
~~1206.12.4~~ Smoke and automatic fire detection	1207.5.4	Yes [e]
~~1206.13~~Technology specific protection	1207.6	Yes
~~1206.12.7~~ Vegetation control	1207.5.7	Yes

a. See Section ~~1206.17.2~~ 1207.10.2.

b. Mobile operations on wheeled vehicle or trailers shall not be required to comply with ~~the~~ Section 1207.4.4 seismic and structural load requirements ~~of Section 1206.11.4~~.

~~d~~c. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

~~e~~d. In walk-in ~~energy storage system~~ units, spacing is not required between ESS units and the walls of the enclosure.

e. Alarm signals are not required to be transmitted to an approved location for mobile ESS deployed 30 days or less.

~~[NY] 1206.17.1~~ 1207.10.1 Charging and storage. For the purpose of Section ~~1206.17~~ 1207.10, charging and storage covers the operation where mobile ESS are charged and stored so they are ready for deployment to another site, and where they are charged and stored after a deployment.

> **Exception:** Mobile ESS used to temporarily provide power to lead-acid and nickel-cadmium systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.2~~ 1207.10.2 Deployment. For the purpose of Section ~~1206.17~~ 1207.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

> **Exception:** Mobile ESS used to temporarily provide power to lead-acid and nickel cadmium systems that are used for DC power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility, and located outdoors or in building spaces used exclusively for such installations. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.3~~ **1207.10.3 Permits.** Construction and operational ~~Building permits and operating~~ permits shall be provided ~~as required by Section 105~~ for charging and storage of mobile ESS and operational permits shall be provided for deployment of mobile ESS as required by Section 1207.1.4.

~~[NY] 1206.17.4~~ **1207.10.4 Construction documents.** Construction documents complying with Section ~~1206.4~~ 1207.1.5 shall be provided with the ~~building~~ construction permit application for mobile ESS charging and storage locations.

~~[NY] 1206.17.4.1~~**1207.10.4.1 Deployment documents.** The following information shall be provided with the ~~operating~~ operation permit applications for mobile ESS deployments:

1.Relevant information for the mobile ESS equipment and protection measures in the construction documents required by Section ~~1206.4~~ 1207.1.5.

2.Location and layout diagram of the area in which the mobile ESS is to be deployed, including a scale diagram of all nearby exposures.

3.Location and content of signage, including no smoking signs ~~and signage complying with Section 1206.11.8~~.

4.Description of fencing to be provided around the ESS, including locking methods.

5.Details on fire suppression, smoke and automatic fire detection, system monitoring, thermal management, exhaust ventilation, and explosion control, if provided.

6.For deployment, the intended duration of ~~the deployment~~ operation, including anticipated connection and disconnection times and dates.

7.Location and description of local staging stops during transit to the deployment site. See Section ~~1206.17.7.5~~ 1207.10.7.5.

8.Description of the temporary wiring, including connection methods, conductor type and size, and circuit overcurrent protection to be provided.

9.Description of how fire suppression system connections to water supplies or extinguishing agents are to be provided.

10.Contact information for personnel who are responsible for maintaining and servicing the equipment, and responding to emergencies as required by Section 1207.1.8.1~~1206.7.1~~. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.5~~ **1207.10.5 Approved locations.** Locations where mobile ESS are charged, stored and deployed shall be restricted to the locations established on the ~~building permits~~ construction and operational permits.

~~[NY] 1206.17.6~~ **1207.10.6 Charging and storage.** Installations where mobile ESS are charged and stored shall be treated as permanent ESS indoor or outdoor installations, and shall comply with the following sections, as applicable:

1.Indoor charging and storage shall comply with Section ~~1206.14~~ 1207.7.

2.Outdoor charging and storage shall comply with Section ~~1206.15~~ 1207.8.

3.Charging and storage on rooftops and in open parking garages shall comply with Section 1207.9.~~1206.16~~

Exceptions:

1.Electrical connections shall be permitted to be made using temporary wiring complying with the manufacturer's instructions, the UL 9540 listing, and NFPA 70.

2.Fire suppression system connections to the water supply shall be permitted to use approved temporary connections. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7~~ **1207.10.7 Deployed mobile ESS requirements.** Deployed mobile ESS equipment and operations shall comply with this section and Table 1207.10.~~1206.17~~ (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7~~ **1207.10.7.1 Duration.** The duration of mobile ESS deployment shall not exceed 30 days.

Exceptions:

1.Mobile ESS deployments that provide power for durations longer than 30 days shall comply with Section 1207.10.6.~~1206.17.6~~

2.Mobile ESS deployments shall not exceed 180 days unless additional operational permits are obtained. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7.2~~ 1207.10.7.2 **Restricted locations.** Deployed mobile ESS operations shall not be located indoors, in covered parking garages, on rooftops, below grade, or under building overhangs. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7.3~~ 1207.10.7.3 **Clearance to exposures.** ~~Deployed mobile energy storage systems shall be separated by a minimum 50 feet (15.3 m) from public seating areas and from tents, canopies and membrane structures with an occupant load of 30 or more.~~ Deployed mobile ESS shall be separated by a minimum 10 feet (3048 mm) from the following exposures:

1.Public ways

2.Buildings

3.Stored combustible materials

4.Hazardous materials

5.High-piled stock

6.Other exposure hazards

Deployed mobile ESS shall be separated by a minimum 50 feet (15.3 M) from public seating areas and from tents, canopies, and membrane structures with an *occupant load* of 30 or more. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7.4~~1207.10.7.4 **Electrical connections.** Electrical connections shall be made in accordance with the manufacturer's instructions and the UL 9540 listing. Temporary wiring for electrical power connections shall comply with NFPA 70. Fixed electrical wiring shall not be provided. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.5.1~~ 1207.10.5 **Local staging.** *Mobile* ~~*energy storage systems*~~ ESS in transit from the charging and storage location to the deployment location and back shall not be parked within 100 feet (30 480 mm) of an occupied building for more than one hour during transit, unless specifically ~~permitted by Section 1206.17.3~~ *approved* by the *fire code official* when the permit is issued. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7.5~~ 1207.10.7.6 **Fencing.** An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of a deployed mobile ESS. (Material based on NFPA 855 2023 Ed.)

~~[NY] 1206.17.7.6~~ 1207.10.7.7 **Smoking.** Smoking shall be prohibited within 10 feet (3048 mm) of mobile ESS. Signs shall be posted in accordance with Section 310.

~~[NY] 1206.18~~ 1207.11 **ESS in Group R-3 and R-4 occupancies.** ESS in Group R-3 and R-4 occupancies shall be ~~installed and maintained~~ in accordance with Sections 1207.11.1 through 1207.11.9 ~~1206.18.1 through 1206.18.9. The temporary use of an owner or occupant's electric powered vehicle as an energy storage system shall be in accordance with Section 1206.18.11 Energy storage system installations exceeding the permitted aggregate ratings in Section 1206.18.4 shall be installed in accordance with Section 1206.2 through 1206.17.7.7.~~

Exceptions:

1.ESS *listed* and *labeled* in accordance with UL 9540 and marked “For use in residential dwelling units,” where installed in accordance with the manufacturer’s instructions and NFPA 70.

2.ESS rated less than 1 kWh (3.6 megajoules).

~~[NY] 1206.18.1~~ 1207.11.1 **Equipment listings.** ESS shall be listed and labeled in accordance with UL 9540. ESS listed and labeled solely for utility or commercial use shall not be used for residential applications.

Exceptions:

1. ~~Where approved by the fire code official, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.~~ ESS listed and labeled in accordance

with UL 9540 and marked “For use in residential dwelling units”, where installed in accordance with the manufacturer’s instructions and NFPA 70.

2. ESS rated less than 1 kWh (3.6 megajoules).

~~1206.18.2,~~1207.11.2 **Installation.** ESS shall be installed in accordance with the manufacturer's instructions and their listing.

~~[NY]1206.18.2.1~~ 1207.11.2.1 **Spacing**. Individual ESS units shall be separated from each other by at least 3 feet (~~914~~ 910 mm) except where smaller separation distances are documented to be adequate based on large-scale fire testing complying with Section 1207.1.5.

~~[NY]1206.18.3~~ 1207.11.3 **Location.** ESS shall be installed only in the following locations:

1. Detached garages and detached accessory structures.

2. Attached garages separated from the *dwelling unit* living space and *sleeping units* in accordance with Section 406.3.2 of the *International Building Code*.

3. Outdoors or on the exterior side of exterior walls located a minimum of 3 feet (~~914~~ 910mm) from doors and windows directly entering the dwelling unit.

4. Enclosed utility closets, *basements*, storage or utility spaces within dwelling units and sleeping units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8 in. Type X gypsum wallboard.

ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

[NY]~~1206.18.4~~1207.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating of the ESS shall not exceed:

1. 40 kWh within utility closets, basements, and storage or utility spaces.

2. 80 kWh in attached or detached garages and detached accessory structures.

3. 80 kWh on exterior walls.

4. 80 kWh outdoors on the ground.

ESS installations exceeding the permitted individual or aggregate ratings shall be installed in accordance with Section 1207.1 through 1207.9 and 1207.12 through 1207.14.

~~[NY1206.18.5~~ 1207.11.5 **Electrical installation.** ESS shall be installed in accordance with NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

~~[NY]1206.18.6~~ **1207.11.6 Fire detection.** ESS installed in group R-3 and R-4 occupancies shall comply with the following:

1. Rooms and areas within dwellings units, sleeping units, *basements* and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.11.

2. ~~A heat detector or heat alarm listed and interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.~~ A *listed* heat alarm where smoke alarms cannot be installed based on their listing.

~~[NY] 1206.18.8~~1207.11.7 **Protection from impact.** ESS installed in a location subject to vehicle damage in accordance with ~~shalll be protected by approved barriers.~~ Section 1207.11.7.1 or 1207.11.7.2 shall be provided with impact protection in accordance with Section 1207.11.7.3.

1207.11.7.1 Garages. Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section 1207.11.3 shall be provided. The normal driving path is a space between the garage vehicle opening and the interior face of the back wall to a height of 48 inches (1219 mm) above the finished floor. The width of the normal driving path shall be equal to the width of the garage door opening. Impact protection shall also be provided for an ESS installed at either of the following locations (see Figure 1207.11.7.1)

1. On the interior face of the back wall and located within 36 inches (914 mm) to the left or the right of the normal driving path.

2. On the interior face of a side wall and located within 24 inches (610 mm) of the back wall and 36 inches (914 mm) of the normal driving path.

Exception: Where the clear height of the vehicle garage opening is 7 feet 6 inches, (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

1207.11.7.2 Other locations subject to vehicle impact. Where an ESS is installed in a location other than as defined in Section 1207.11.7.1, and is subject to vehicle damage, impact protection shall be provided in accordance with Section 1207.11.7.3.

1207.11.7.3 Impact Protection Options. Where ESS is required to be protected from impact in accordance with Section 1207.11.7.1 or 1207.11.7.2, such protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:

   1.1 Minimum 48 inches (1219 mm) in length by 3 inches (76mm) in diameter Schedule 80 steel pipe embedded in a concrete pier not less than 12 inches (304 mm) deep and 6 inches (152 mm) in diameter, with at least 36 inches (914 mm) of pipe exposed, filled with concrete and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.

   1.2 Minimum 36 inches (914 mm) in height by 3 inches (76 mm) in diameter Schedule 80 steel pipe fully welded to a minimum 8 inches (203 mm) by ¼ inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of four ½ inch (13 mm) concrete anchors with 3 inch (76 mm) minimum embedment. Spacing shall be not greater than 60 inches (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.

   1.3 Pre-manufactured steel pipe bollards shall be filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than a 60 inches (1524 mm). Each bollard shall be located not less than 6 inches (152mm) from the ESS.

2. Wheel barriers constructed in accordance with one of the following:

   2.1. Four inches (102 mm) in height by 5 inches (127 mm) in width by 70 inches (1778 mm) in elight wheel barrier made of concrete or polymer, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS. Minimum 3 - ½ inch (89 mm) diameter concrete anchors with 3 inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be not greater than 36 inches (914 mm).

   2.2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturer’s installation instructions.

3. *Approved* method designed to resist a 2,000-pound-force (8896 N) impact in the direction of travel at 24 inches (610 mm) above grade.

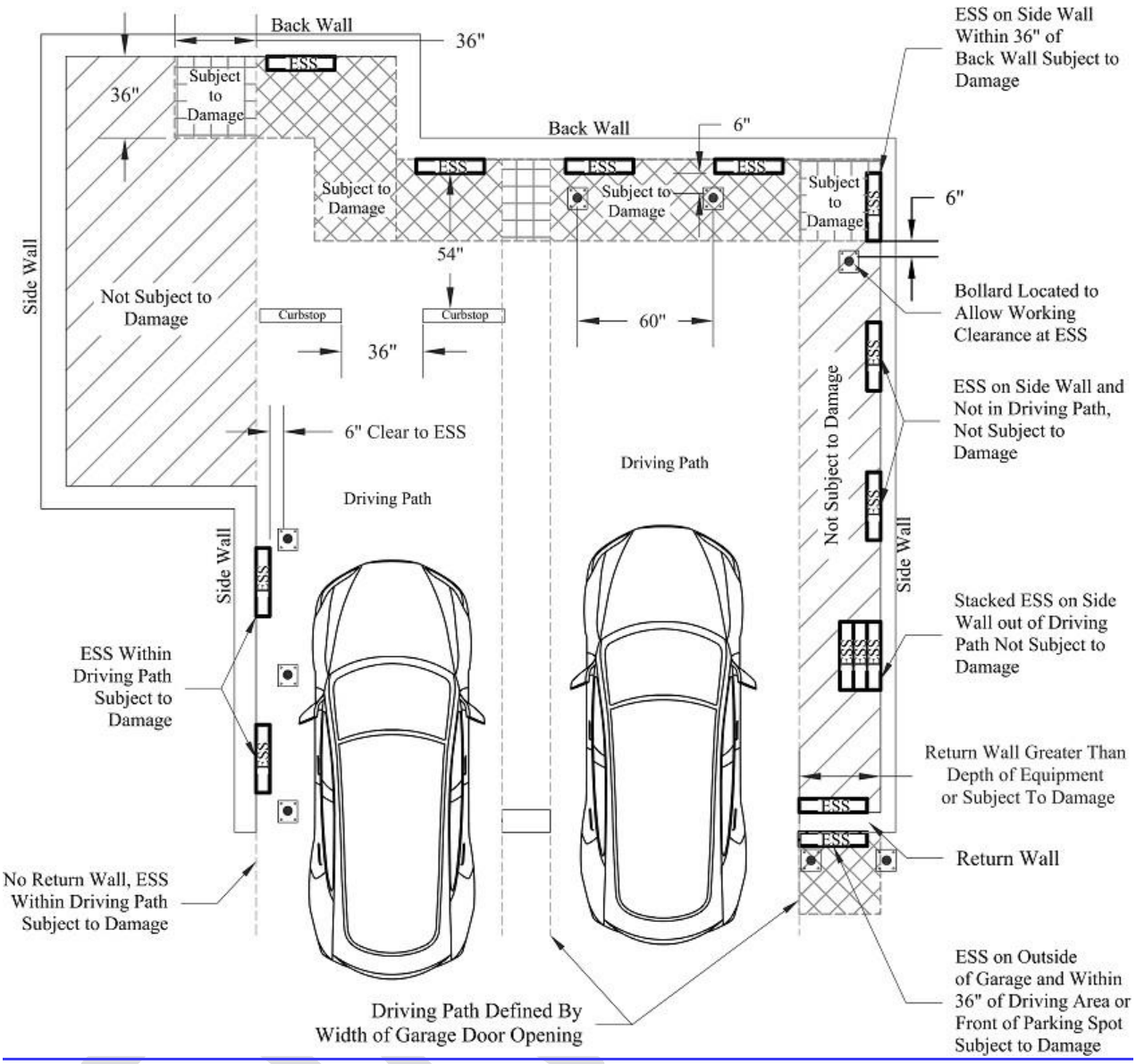


FIGURE 1207.11.7.1

ESS VEHICLE IMPACT PROTECTION

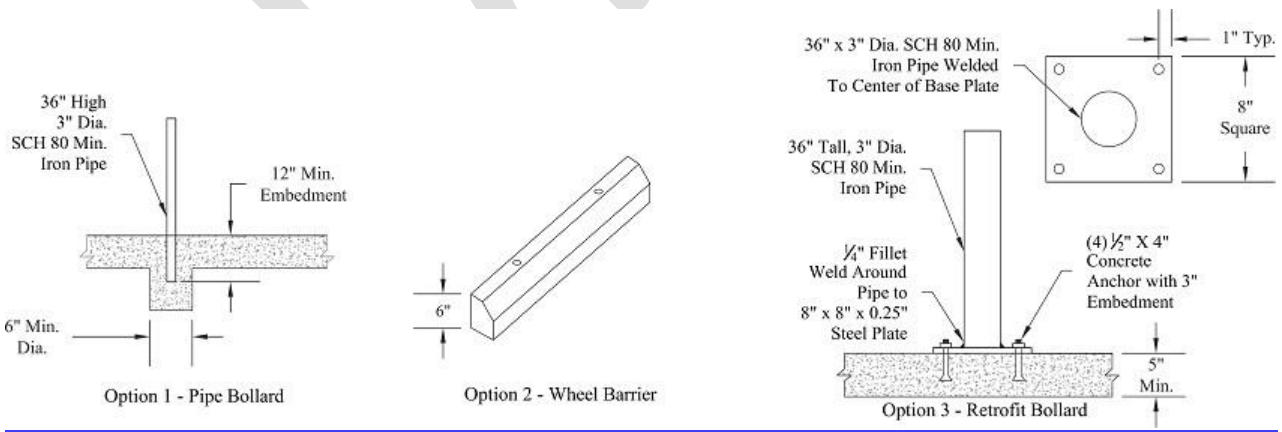


FIGURE 1207.11.7.3

IMPACT PROTECTION OPTIONS

~~[NY] 1206.18.9~~1207.11.8 **Ventilation.** Indoor installations of ESS that include batteries that produce hydrogen or other *flammable gases* during charging shall be provided with exhaust ventilation in accordance with Section 304.5 of the *International Mechanical Code* ~~1206.13.1~~.

~~[NY] 1206.18.10~~1207.11.9 **Toxic and highly toxic gas.** ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.

[NY] ~~1206.18.11~~1207.11.10 **Electric vehicle use.** The temporary use of an owner or occupant's electric-powered vehicle to power a dwelling unit or sleeping unit while parked in an attached or detached garage or outdoors ~~outside~~ shall comply with the vehicle manufacturer's instructions and NFPA 70. The batteries on electric vehicles shall not contribute to the aggregate energy limitations in Section 1207.11.4 ~~1206.18.4~~.

[NY] ~~1206.18.7~~ 1207.11.11**Fire-resistance rating.** Rooms and areas containing *energy storage systems* shall be protected on the system side by 2-hour rated *fire barriers* constructed in accordance with Section 707 of the *Building Code of New York State* and 2-hour rated *horizontal assemblies* constructed in accordance with Section 711 of the *Building Code of New York State*, as applicable.

[NY] 1207.12 Peer review. The *owner's* of all electrochemical ESS that exceed the amounts in Table 1207.5 shall be responsible for retaining and furnishing the services of a *registered professional engineer* or special expert, to perform a peer review, subject to the *approval* of the *fire code official*.

[NY] 1207.12.1 Costs. The costs of special services, where required by the *authority having jurisdiction*, shall be paid by the *owner*.

[NY] 1207.12.2 Special expert. Where the scope of work is limited or focused in an area that does not require the services of a *registered design professional* or the special knowledge and skills associated with the practice of architecture or engineering, an *approved* special expert may be employed by the owner or the owner's authorized agent as the person in responsible charge of the limited or focused activity.

[NY] 1207.12.2.1 Scope of work. The scope of work of a special expert shall be limited to the area of expertise as demonstrated in the documentation submitted to the *fire code official* for review and *approval*.

[NY] 1207.12.2.2 Special expert qualifications. Special experts are those individuals who possess the following qualifications:

1. Has credentials of education and experience in an area of practice that is needed to evaluate risks and safe operations associated with the design, operation and special hazards of *energy storage systems*.
2. Licensing or registration, when required by any other applicable statute, regulation, or local law or ordinance.
3. Be trained and knowledgeable in the installation and operation of the stationary energy storage system, such as a person engaged in the design or installation of such systems.

[NY] 1207.12.3 Peer Review report. Peer reviewers will be expected to conduct thorough evaluations of project design and product safety. The peer review will result in a report identifying items that were reviewed, any deficiencies noted, and recommendations. The report will be included with the permit application. Application documents subject to peer review will include but not be limited to:

1. Site plan
2. Emergency operations plan
3. UL 9540A report
4. Hazard mitigation analysis
5. Manufacturer specifications
6. UL listings and associated documentation
7. NFPA standards and associated documentation
8. Electrical drawings
9. Explosion control verification
10. Monitoring procedures
11. Alarm activation criteria
12. Fire protection system
13. Other project application documents

[NY] 1207.13 First responder pre-incident plan. ESS owners shall develop and maintain a pre-incident plan for the facility. The plan shall be developed in consultation with the local fire department and shall meet the requirements in section 11 of Annex G of NFPA 855. Annex G Section 11 of NFPA 855 is modified by replacing the word " should" with "shall" when it applies to owner's requirements in the following sections:

1. G.11.2.1
2. G.11.2.2
3. G.11.3
4. G.11.4 (last sentence only)
5. G.11.5 (first instance only)
6. G.11.6
7. G.11.7.5

[NY] 1207.13.1 First responder site familiarization.
ESS owners shall provide an annual site visit and review of the pre-incident plan developed in accordance with Section 1207.13 of this code to the local Fire Department.
Exception: Where a facility has written documentation from the fire chief that the fire department has forgone their opportunity for training.

[NY]1207.14 ESS third party fire safety inspection
Electrochemical ESS that exceed the amounts in Table 1207.5 shall have a third party fire safety inspection performed every 3 years or more frequently as requested by the *fire code official*. The inspection shall be performed by a registered professional engineer or a special expert meeting the requirement of Section 1207.2.2.

[NY]1207.14.1 ESS third party safety inspection
The ESS third party fire safety inspection shall cover the following:

1. Structural integrity and weathertightness of enclosures
2. Operation and maintenance of the ESS
3. Emergency Operations Plan
4. Hazard Mitigation Analysis
5. Electrical inspection
6. Explosion control verification
7. Monitoring procedures and history
8. Alarm activation criteria and history
9. System performance concerns
10. Fire protection system(s) inspection and testing records
11. Ventilation system
12. Other items as requested by the *authority having jurisdiction*

CHAPTER 22 COMBUSTIBLE DUST ~~PRODUCING OPERATIONS~~

~~**SECTION**~~
2201 GENERAL

2201.1 Scope. The equipment, processes and operations involving dust explosion hazards and use or handling of *combustible dust* shall comply with the provisions of this chapter.

Exceptions:

1.In an unsprinklered building, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 5 pounds (2.3 kg) or 0.7 cu ft. (0.019822 m^3)

2.In a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 10 pounds (4.5 kg) or 1.4 cu ft. (0.039644 m^3)

3.Storage and use of consumer materials in Group B or R occupancies.

4.Storage and use of commercially packaged materials in Group M occupancies.

5.Materials displayed in original packaging in Group M occupancies and intended as building materials or for personal or household use.

6.Storage of sealed containers of *combustible dust* at facilities not associated with an operation that uses, handles or generates *combustible dust*.

7.Materials stored or used in farm buildings or similar occupancies intended for on-premises agricultural purposes.

SECTION 2202
DEFINITIONS

2202.1 Definitions. The following terms are ~~is~~ defined in Chapter 2:

DUST COLLECTION SYSTEM

COMBUSTIBLE DUST.

SECTION 2203
DUST EXPLOSION PREVENTION ~~PRECAUTIONS~~

~~**2203.1 Owner responsibility.** The owner or operator of a facility with operations that manufacture, process, blend, convey, repackage, generate or handle potentially combustible dust or combustible particulate solids shall be responsible for compliance with the provisions of this code and NFPA 652.~~

2203.1 Critical Depth Layer. The maximum dust layer on all surfaces, including but not limited to walls, ceilings, beams, equipment, furniture, pipes and ducts, shall not exceed the critical depth layer specified in Table 2203.1. The critical depth layer depth is permitted to be adjusted for explosion hazard where further evaluated in accordance with one of the following:

1.Section 622.1.3 of NFPA 654.

2.Section 4.1.3.3 of NFPA 664 for wood flour.

Accumulated *combustible dust* shall be collected by one of the methods listed in Section 2203.5.

TABLE 2203.1

CRITICAL DEPTH LAYER

Type of Dust	**Critical Depth Layer (Inches)**
Wood Flour	1/8
All Other Dusts	1/32

For SI:1 inch = 25.4 mm

~~**2203.2 Dust hazard analysis (DHA).** The requirements of NFPA 652 apply to all new and existing facilities and operations with combustible dust hazard. Existing facilities shall have a dust hazard analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.~~

~~The fire code official shall be authorized to order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis.~~

2203.2 Dust Producing and Dust Handling Equipment. Dust producing equipment and dust handling equipment, including but not limited to vacuums, dust collection systems, dryers, mixers, blenders, separators, conveyors, storage containers, silos or other similar devices shall be *listed* and shall be maintained in accordance with the manufacturer's recommended standards.

2203.2.1 Signages and Markings. Signages and markings shall be provided in accordance with Section 2203.2.1.1 through 2203.2.1.3.

2203.2.1.1 Deflagration Vent Discharge Area Markings. Where dust collection systems and other equipment, systems, or systems components are provided with *deflagration* vents, the area within the *deflagration* vent's discharge area shall be marked in an *approved* manner.

2203.2.1.2 Caution Signs. Signs that reads as follows shall be posted near the dust-containing equipment with deflagration vents:

CAUTION: THIS EQUIPMENT CAN CONTAIN EXPLOSIVE DUST.

KEEP OUTSIDE THE MARKED AREA WHILE EQUIPMENT IS OPERATING.

2203.2.1.3 Warning Signs. Where dust collection systems and other equipment, systems, or systems components are provided with deflagration vents, vent closures shall be clearly marked as follows:

WARNING: EXPLOSION RELIEF DEVICE. STAY CLEAR.

2203.3 Dust Collection and Conveying Systems. Dust collection and conveying systems shall be in accordance with Sections 2203.3.1 through 2203.3.3.

2203.3.1 Dust Collection Systems. Dust collection systems shall be designed to collect dust emissions from dust producing equipment at the point of generation. Dust collection systems shall be in accordance with Section 510 of the *International Mechanical Code*.

> **Exception:** *Closed systems* using *listed* equipment and designed in accordance with manufacturer's recommendations and specifications, where cleanouts are provided in accordance with Section 2203.3.3.

Heating, ventilation, and air conditioning (HVAC) systems shall not be used as the means to collect dusts from localized sources.

2203.3.1.1 Location. Dust collectors shall be located outside of buildings.

> **Exceptions:**
>
> 1. Dust collectors inside of buildings complying with Section 511 of the *International Mechanical Code*.
> 2. Wet-type dust collectors when specifically *listed* for the type of dust conveyed shall be permitted inside of buildings where in accordance with the manufacturer's instructions and specifications.
> 3. Dust collectors designed to specific NFPA standards listed in Table 2205.1 for the specific type of dust conveyed.

2203.3.1.2 Minimum Conveying Velocities. The minimum velocities within ducts used as part of the dust collection system shall be in accordance with Table 2203.3.1.2.

TABLE 2203.3.1.2

MINIMUM CONVEYING VELOCITIES

Type of Product	**Feet Per Minute**
Fine light dust, such as cotton, lint, and wood flour (100 mesh and under)	2000 (10 m/s)
Dry dust such as fine rubber molding powder	2500 (13 m/s)
Average dust such as sawdust, grinding dust, coal dust	3500 (18 m/s)
Heavy dust such as metal turnings, including aluminum and magnesium powder	4000 (20 m/s)

For SI: 1 foot per minute = 0.00508 m/s.

2203.3.2 Plastic Ducts and Conveying Systems. Plastic, fiberglass, other nonconductive ducts, duct liners or pipes shall not be used as part of ducts and conveying systems. Ductwork utilizing a combustible lining shall be permitted only in high impact areas and where *approved*. Flexible hose shall be permitted if designed and installed in accordance with the following requirements:

1.Manufactured of static dissipative construction.

2.Used only for connections and isolation purposes.

3.Limited to 18 inches (457 mm) in length.

4.Properly grounded.

~~**2203.3 Sources of ignition.** Smoking, the use of heating or other devices employing an open flame, or the use of spark producing equipment is prohibited in areas where combustible dust is generated, stored, manufactured, processed or handled.~~

2203.3.3 Cleanouts. Openings shall be provided in enclosed equipment and conveyors to allow access to all parts of the equipment and conveyors to permit inspection, cleaning, maintenance, and the effective use of portable extinguishers or hose streams. Cleanouts for ducts used as part of the dust collection system shall be in accordance with the *International Mechanical Code*.

~~**2203.4 Housekeeping.** Accumulation of combustible dust shall be kept to a minimum in the interior of buildings. Accumulated combustible dust shall be collected by vacuum cleaning or other means that will not place combustible dust into suspension in air. Forced air or similar methods shall not be used to remove dust from surfaces.~~

2203.4 Sources of Ignition. Sources of Ignition shall be controlled in accordance with Sections 2203.4.1 through 2203.4.9.5.

2203.4.1 Classified Electrical. Classified electrical shall be in accordance with NFPA 70. Electrical motors and electrical components of the equipment shall not be installed in the dust laden air stream unless *listed* for Class II, Division 1 locations.

2203.4.2 Static Electricity. Bonding and grounding is required to minimize accumulation of static electric charge in the following locations:

1.Dust producing equipment

2.Dust collection system.

3.Pneumatic dust conveying systems conveying *combustible dust* from one location to another, *combustible dust* conveyors, piping and conductive components. Conveying systems include transport modes such as railcars, hopper cars, boxcars, tank cars and trucks into which or from which commodities or products are pneumatically conveyed.

4.Conveying systems using metallic piping.

2203.4.3 Hot Works. Hot work and similar spark producing operations shall not be conducted in or adjacent to *combustible dust* producing areas unless precautions have been taken to provide safety. Hot work shall be permitted only in safe, designated areas in accordance with Chapter 35. Hot work is prohibited on equipment that is operating.

2203.4.3.1 Signs. Conspicuous signs with the following warning shall be posted in the vicinity of *combustible dust*-producing areas or in the vicinity of *combustible dust* use:

NO WELDING. THE USE OF WELDING OR CUTTING EQUIPMENT IN OR NEAR THIS AREA IS DANGEROUS BECAUSE OF FIRE AND EXPLOSION HAZARDS. WELDING AND CUTTING SHALL BE DONE ONLY UNDER THE SUPERVISION OF THE PERSON IN CHARGE.

2203.4.4 Hot Surfaces and Hot Equipment. In areas where a dust explosion hazard or dust flash fire hazard exists, the temperature of external surfaces, shall be maintained below 80 percent of the lower of the dust- surface ignition temperature or the dust-cloud ignition temperature for worst-case dusts. External surfaces shall include but not limited to:

1.Compressors.

2.Steam, water or process piping.

3.Ducts.

4.Conveyors.

5.Process equipment.

Where steam pipes or hot surfaces occur in dust-producing or dust-handling areas, accumulation of dust on the surfaces shall be minimized by an *approved* method.

Exception: Drying apparatus *listed* for the intended use and installed in accordance with the manufacturer's instructions.

2203.4.5 Powered Industrial Trucks. Powered industrial trucks used in electrically classified areas shall be *listed* for such use.

2203.4.6 Smoking Prohibited. Smoking shall be prohibited in or adjacent to dust producing or dust handling areas. "No Smoking" signs complying with Section 310 shall be conspicuously posted in such areas. Smoking shall be permitted only in designated areas.

2203.4.7 Spark Producing Devices. Spark-producing devices shall not be located within 20 feet (6096 mm) of areas requiring classified electrical unless separated by a permanent partition.

2203.4.8 Self-heating materials. Materials in silos and other large storage piles of particulates prone to self-heating shall be in accordance with Section 9.4.11 of NFPA 652.

2203.4.9 Open Flames and Fuel Fired Equipment. Open flames and fuel fired equipment shall be in accordance with Section 2203.4.9.1 through 2203.4.9.5.

2203.4.9.1 Release or Airborne Combustible Dust. Production, maintenance or repair activities that have the potential to release or force *combustible dust* to become airborne shall not be conducted within 35 feet (11 m) of an open flame or pilot flame.

2203.4.9.2 Space Heaters. Fuel-fired space heaters drawing local ambient air shall not be located within electrically classified areas. Space heating appliances in dust producing or dust handling areas shall be located where not subject to accumulation of deposits of *combustible dust*.

2203.4.9.3 Equipment Listing. Fuel-fired process equipment shall be *listed* for its intended use and shall be operated and maintained in accordance with the manufacturer's instructions.

2203.4.9.4 Inspection and Preventative Maintenance. Inspection and maintenance of fuel-fired process equipment shall include verification that significant *combustible dust* accumulations do not exist within or around the equipment.

2203.4.9.5 Sources of Combustion Air. In Class II electrically classified locations, heating units shall be provided with a source of combustion air ducted directly from the building exterior or from an unclassified location.

2203.5 Housekeeping. Accumulation of *combustible dus*t on surfaces inside buildings shall be maintained below the critical depth layer in Section 2203.1. Pressurized air or similar methods shall not be used to remove dust from surfaces. Accumulated *combustible dust* shall be collected by one of the following methods:

1.Portable vacuum cleaners *listed* for use in Class II, Group G, Division 1 atmospheres as defined in NFPA 70.

2.Dust collection systems.

3.Other *approved* means that will not place *combustible dust* into suspension in air.

Exception: Forced air or similar methods shall be permitted to remove dust in accordance with NFPA 652, NFPA 654 or NFPA 664.

2203.6 Standard Operational Procedures. Dust producing equipment and all associated equipment including dust collection equipment, shall be maintained in accordance with the manufacturer's instructions and specifications and applicable codes. The inspection, testing and maintenance program shall include the following, as applicable:

1.Fire and explosion protection and prevention equipment, as applicable, in accordance with the appropriate NFPA standards.

2.Dust control equipment.

3.Control of potential ignition sources.

4.Electrical, process and mechanical equipment, including applicable process interlocks.

5.Lubrication of bearings for dust collection, dust handling and dust producing equipment.

6.Additional maintenance in accordance with the manufacturer's instructions and specifications for dust collection, dust handling and dust producing equipment.

Records shall be kept of maintenance and repairs performed. The standard operating procedures shall be submitted to the *fire code official* for review and approval. The written standard operating procedures shall be signed by the persons responsible for facility operations.

2203.7 Emergency Response Plan. A written emergency response plan shall be developed for preventing, preparing for and responding to work-related emergencies including but not limited to fire and explosion. The following information shall be developed into the plan:

1.Identification of dust hazards.

2.Identification and location of all utilities to affected areas.

3.Site plans or floor plans locating utility shut-off controls including water, gas and power.

4.T potential for explosion.

5.Locations of fire extinguishing equipment compatible with the hazards present.

6.Any additional information required by the *fire code official*.

2203.8 Training. The plans and procedures required in Sections 2203.5, 2203.6 and 2203.7 shall be *approved* by the *fire code official*. The plans and procedures shall be reviewed annually and updated as required by process changes. Initial and annual refresher training shall be provided to employees who are involved in operating, maintaining and supervising facilities that handle *combustible dust*. Initial and annual refresher training shall include:

1.Workplace hazards.

2.General orientation, plant diagrams and plant safety rules.

3.Process description or flowchart.

4.Equipment operation, safe startup and shutdown, and response to hazard conditions or an incident.

5.The location and use of all related fire and explosion protection and prevention systems.

6.Equipment maintenance requirements and practices, including visual inspections of conveyors and ducts.

7.Housekeeping requirements, including the maintenance of the critical depth layer in Section 2203.1.

8.Emergency response plans as required in Section 2203.7.

The employer shall maintain records of initial and annually training and review.

SECTION 2204
~~ADDITIONAL REQUIREMENTS~~ DUST EXPLOSION SCREENING TESTS

~~**SECTION 2204**~~
~~2204.1 Specific hazards standards.~~ ~~**The industry- or commodity-specific codes and standards listed in Table 2204.1 shall be complied with based on the identification and evaluation of the specific fire and deflagration hazards that exist at a facility.**~~

2204.1 Combustibility and Explosivity Tests. Where combustibility or explosivity screening tests are required to analyze the *combustible dust* as part of compliance with Section 104.9 and Section 414.1.3 of the *International Building Code*, they shall be in accordance with Section 5.4 of NFPA 652.

2204.2 Samples. Representative samples for the screening test shall be obtained in accordance with Section 5.5 of NFPA 652.

SECTION 2205
STANDARDS

2205.1 Specific Hazards Standards. The *fire code official* is authorized to enforce additional industry or material specific provisions of the codes and standards listed in Table 2205.1 as applicable to prevent and control dust explosions, as applicable.

TABLE ~~2204.1~~2205.1

~~SPECIFIC HAZARDS STANDARDS~~EXPLOSION PROTECTION STANDARDS

Standard	Subject
NFPA 61	Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
NFPA 68	Standard on Explosion Protection by Deflagration Venting
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electrical Code
NFPA 77	Recommended Practice on Static Electricity168-18
NFPA 85	Boiler and Combustion System Hazards Code
NFPA 120	Standard for Fire Prevention and Control in Coal Mines
NFPA 484	Standard for Combustible Metals
NFPA 652	Standard on the Fundamentals of Combustible Dust
NFPA 654	Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
NFPA 655	Standard for the Prevention of Sulfur Fires and Explosions
NFPA 664	Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

2205.1.1 Dust Hazard Analysis. If a dust hazard analysis (DHA) is required by the *fire code official* to new or existing facilities and operations, it shall be in accordance with NFPA 652. The DHA for existing facilities shall be in accordance with Section 7.1.2 of NFPA 652.

CHAPTER 23 MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

2303.1 Location of dispensing devices. Dispensing devices shall be located as follows:

1.Ten feet (3048 mm) or more from lot lines.

2.Ten feet (3048 mm) or more from buildings having combustible exterior wall surfaces or buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly or buildings having combustible overhangs.

Exception: Canopies constructed in accordance with the International Building Code providing weather protection for the fuel islands.

3.Such that all portions of the vehicle being fueled will be on the premises of the motor fuel-dispensing facility.

4.Such that the nozzle, where the hose is fully extended, will not reach within 5 feet (1524 mm) of building openings.

5.Twenty feet (6096 mm) or more from fixed sources of ignition.

6.Such that fuel dispensing is in view of the attendant at attended self-service motor fuel-dispensing facilities, as required by Section 2304.2.4.

2304.2.4 Obstructions to view. The attendant shall have a direct line of sight to observe fuel dispensing operations at all times. Obstructions shall not be placed between the dispensing area and the attendant.

Exception: Video monitoring systems shall be permitted to supplement direct line of sight supervision where approved by the fire code official.

2308.1 General. Motor fuel-dispensing facilities for compressed natural gas (CNG) fuel shall be in accordance with this section, ~~and~~ Chapter 53 and Section 413 of the *International Fuel Gas Code*.

2308.2 Approvals. Storage vessels and equipment used for the storage, compression or dispensing of CNG shall be approved or listed in accordance with Sections 2308.2.1 ~~and 2308.2.2.~~through 2308.2.4.

2308.2.3 Residential fueling appliance (RFA). Residential fueling appliances shall be *listed* and installed in accordance with installation requirements of CSA/ANSI NGV 5.1, manufacturer installation instructions, and Section 413 of the International Fuel Gas Code. The capacity of an RFA shall not exceed 5 cubic feet per minute (0.14 m^3/min) of natural gas.

2308.2.4 Vehicle fueling appliance (VFA). Non-residential fueling appliances shall be *listed* and installed in accordance with installation requirements of CSA/ANSI NGV 5.2, manufacturer installation instructions, and requirements of Section 413 of the International Fuel Gas Code for VFAs. The capacity of the VFA shall not exceed 10 cubic feet per minute (0.28m^3/min) of natural gas.

2309.1 General. Hydrogen motor fuel-dispensing and generation facilities shall be in accordance with this section, ~~and~~ Chapter 58 and NFPA 2. Where a fuel-dispensing facility includes a repair garage, the repair operation shall comply with Section 2311.

2309.2.2 Listed or approved equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers, motor-fueling connections and electrical equipment used for hydrogen shall be listed ~~or approved for use with hydrogen. Hydrogen motor-fueling connections shall be listed and labeled~~ or approved for use with hydrogen.

2309.4 Dispensing into motor vehicles at ~~self-service~~ hydrogen motor fuel-dispensing facilities. Self-service hydrogen motor fuel-dispensing systems, including key, code and card lock dispensing systems, shall be limited to the filling of permanently mounted motor vehicle fuel ~~containers~~ tanks on hydrogen-powered vehicles.

In addition to the requirements in Section 2311, the owner of a ~~self-service~~ hydrogen motor fuel-dispensing facility shall provide for the safe operation of the system by complying with this code and the fueling protocols in NFPA 2 and through the institution of a fire safety plan submitted in accordance with Section 404, the training of employees and operators who use and maintain the system in accordance with Section 406, and provisions for hazard communication in accordance with Section 407.

Exception: Filling of non-permanently mounted storage containers or tanks for motor fuel-dispensing system testing purposes is permitted.

2309.5.2.1 Identification. Manual emergency shutoff valves shall be identified and the location shall be clearly visible, ~~accessible~~ have access and be indicated by means of a sign.

2309.6 Repairs, purging, defueling and discharge. The repair, purging, defueling or discharge activities associated with hydrogen motor fuel ~~supply systems and~~ dispensing and generation systems, storage tanks and the installation of the systems shall be in accordance with Chapters 53 and 58 and NFPA 2.

> **Exception:** The motor vehicle fuel tank and the fuel supply piping from the motor vehicle fuel ~~storage~~ tank to the engine compartment on a motor vehicle or forklift unless the fuel tank is required to be defueled in accordance with Section 2311.8.11.

[NY] 2310.4 Fueling of marine vehicles at other than approved marine motor fuel-dispensing facilities. Fueling of floating marine craft at other than a marine motor fuel-dispensing facility shall comply with Sections 2310.4.1 and 2310.4.2, and where applicable, Section 5706.5.4.

2311.8 Repair garages for vehicles fueled by lighter-than-air fuels. The room, motor vehicle repair booth or motor vehicle repair space containing repair garage activities for the conversion or repair of vehicles that use CNG, LNG, hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.8 through 2311.8.11 in addition to the other requirements of Section 2311. Repair garages for the repair of vehicles that use hydrogen fuel shall be in accordance with this code and NFPA 2.

Exceptions:

1. Repair garages where work is conducted only on vehicles where the motor vehicle fuel tank and system that have been defueled and ~~their systems~~ the motor vehicle fuel tank has been purged with nitrogen gas, and where standard operating procedures to document and maintain the fueling status throughout repair operations are approved.

2. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle. Movement of a subassembly on which the motor vehicle fuel tank remains mounted to allow access to other parts of the vehicle that are not a portion of the fuel system shall be permitted.

3. Repair garages for hydrogen-fueled vehicles where work is not performed on the ~~hydrogen storage tank~~motor vehicle fuel tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain less than ~~200~~400 cubic feet (~~5.6~~11.3m^3) of hydrogen.

4. Repair garages for natural-gas-fueled vehicles where work is not being performed on the motor vehicle fuel ~~storage~~ tank, and is limited to the exchange of parts and maintenance not requiring open flame or welding on the natural-gas-fueled vehicle. During the work, the natural gas, in the motor vehicle fuel tank shall contain a pressure of not more than 250 psi at 70°F (1724 kPa at 21°C).

2311.8.11 Defueling equipment required at vehicle maintenance and repair facilities. Facilities for repairing or replacing hydrogen fuel tanks on hydrogen-fueled vehicles shall have equipment to defuel vehicle storage tanks. Where work must be performed on a motor vehicle fuel ~~storage~~ tank for the purpose of maintenance, repair or cylinder certification, defueling and purging shall be conducted in accordance with Section 2309.6 and NFPA 2.

CHAPTER 24 FLAMMABLE FINISHES

2404.2 Prohibited enclosures for spray application operations. Inflatable or portable enclosures shall not be used for spray application of flammable finishes.

> **Exception:** Enclosures for the spray application of flammable finishes in marinas, dry docking areas or construction areas shall comply with Section 2404.3.

2404.3 Membrane enclosures. The design, construction, protection, operation and maintenance of membrane Enclosures shall be in accordance with NFPA 33.

2404.3.3.6 Size. The aggregate area of spray booths in a building shall not exceed the lesser of 10 percent of the area of any floor of a building or the basic area allowed for a Group H-2 occupancy without area increases, as set forth in the International Building Code. ~~The area of an individual spray booth in a building shall not exceed the lesser of the aggregate size limit or 1,500 square feet (139 m2).~~

> **Exception:** One individual booth not exceeding 500 square feet (46 m^2).

2404.3.4 Limited Finishing Workstation. A limited finishing workstation shall comply with the applicable provisions of NFPA 33 and Sections 2404.4 through 2404.8.

2404.6.1.2.1 Interlocks. The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to accomplish all of the following:

1. Prevent operation of the spraying apparatus while drying operations are in progress.
2. Where the drying apparatus is located in the spray booth or spray room, prevent operation of the drying apparatus until a timed purge of spray vapors from the spray booth or spray room is complete. This purge time shall be based on completing not fewer than four air changes of spray booth or spray room volume or for a period of not less than 3 minutes, whichever is greater.
3. Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.
4. Shut off the drying apparatus automatically if the ~~air temperature within the booth~~ discharge temperature of the air heater exceeds the maximum discharge air temperature allowed in accordance with the heater's listing or ~~200~~ 221°F (~~93~~ 105°C), whichever is less.

2404.6.2.1 Glass panels. Panels for luminaires or for observation shall be of heat-treated glass, wired glass or hammered wire glass and shall be sealed to confine vapors, mists, residues, dusts and deposits to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding ~~200~~ 221°F (~~93~~ 105°C).

CHAPTER 27 SEMICONDUCTOR FABRICATION FACILITIES

2703.10.4.4.1 Sprinkler ~~head~~ locations. Automatic sprinklers shall be installed at 12-foot (3658 mm) intervals in horizontal ducts and at changes in direction. In vertical runs, automatic sprinklers shall be installed at the top and at alternate floor levels.

TABLE 2704.2.2.1

QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5

HAZARD CATEGORY	SOLIDS (pounds per square foot)	LIQUIDS (gallons per square foot)	GAS (cubic feet @ NTP per square foot)
Physical-Hazard Materials			
Combustible dust	Note b	Not Applicable	Not Applicable
Combustible fiber Loose Baled	Note b Notes b and c	Not Applicable	Not Applicable
Combustible liquid Class II Class IIIA Class IIIB Combination Class I, II and IIIA	Not Applicable	~~0.01~~ 0.02 ~~0.02~~ 0.04 Not Limited ~~0.04~~ 0.08	Not Applicable
Cryogenic gas Flammable	Not Applicable	Not Applicable	Note d ~~1.25~~ 2.5

Oxidizing			
Explosives	Note b	Note b	Note b
Flammable gas Gaseous Liquefied	Not Applicable	Not Applicable	Note d Note d
Flammable liquid Class IA Class IB Class IC Combination Class IA, IB and IC Combination Class I, II and IIIA	Not Applicable	~~0.0025~~ 0.005 ~~0.025~~ 0.05 ~~0.025~~ 0.05 ~~0.025~~ 0.05 ~~0.04~~ 0.08	Not Applicable
Flammable solid	~~0.001~~0.002	Not Applicable	Not Applicable
Organic peroxide Unclassified detonable Class I Class II Class III Class IV Class V	Note b Note b ~~0.025~~ 0.05 ~~0.1~~ 0.2 Not Limited Not Limited	~~Not Applicable~~ Note b Note b 0.0025 0.02 Not Limited Not Limited	Not Applicable
Oxidizing gas Gaseous Liquefied Combination of gaseous and liquefied	Not Applicable	Not Applicable	~~1.25~~ 2.5 ~~1.25~~ 2.5 ~~1.25~~ 2.5
Oxidizer			
Class 4 Class 3 Class 2 Class 1 Combination Class 1, 2, 3	Note b ~~0.003~~ 0.006 ~~0.003~~ 0.006 ~~0.003~~ 0.006 ~~0.003~~ 0.006	Note b ~~0.03~~ 0.06 ~~0.03~~ 0.06 ~~0.03~~ 0.06 ~~0.03~~ 0.06	Not Applicable
Pyrophoric materials	~~0.01~~Note b	~~0.00125~~0.0025	Notes d and e

Unstable (reactive) Class 4 Class 3 Class 2 Class 1	Note b ~~0.025~~ 0.05 ~~0.1~~ 0.2 Not Limited	Note b ~~0.0025~~ 0.005 ~~0.01~~ 0.02 Not Limited	Note b Note b Note b Not Limited
Water reactive Class 3 Class 2 Class 1	~~Note b~~0.02[f] ~~0.25~~0.5 Not Limited	~~0.00125~~ 0.0025 ~~0.025~~ 0.05 Not Limited	Not Applicable
HEALTH-HAZARD MATERIALS			
Corrosives	Not Limited	Not Limited	Not Limited
Highly toxic	Not Limited	Not Limited	Note d
Toxics	Not Limited	Not Limited	Note d

For SI: 1 pound = 0.454 kg, 1 pound per square foot = 4.882 kg/m , 1 gallon per square foot = 40.7 L/m , 1 cubic foot @ NTP/square foot = 0.305 m @ NTP/m , 1 cubic foot = 0.02832 m .

a. Hazardous materials within piping shall not be included in the calculated quantities.

b. Quantity of hazardous materials in a single fabrication area shall not exceed the maximum allowable quantities per control area in Tables 5003.1.1(1) and 5003.1.1(2).

c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.

d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed the greater of 0.2 cubic feet at NTP/square foot or 9,000 cubic feet at NTP.

e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 5003.8.2.

f. Quantity of Class 3 water-reactive solids in a single tool shall not exceed 1 pound.

CHAPTER 28 LUMBER YARDS AND AGRO-INDUSTRIAL, SOLID BIOMASS AND WOODWORKING FACILITIES

2808.3 Size of piles or stacks. Piles shall not exceed 25 feet (7620 mm) in height, 150 feet (45 720 mm) in width and 250 feet (76 200 mm) in length. Stackable products shall not be stacked in excess of 25 feet (7620 mm) in height, 80 feet (24383 mm) in width and 250 feet (76200 mm) in length.

~~**Exception:** The fire code official is authorized to allow the pile size to be increased where a fire protection plan is provided for approval that includes, but is not limited to, the following:~~

~~1.Storage yard areas and materials-handling equipment selection, design and arrangement shall be based on sound fire prevention and protection principles.~~

~~2.Factors that lead to spontaneous heating shall be identified in the plan, and control of the various factors shall be identified and implemented, including provisions for monitoring the internal condition of the pile.~~

~~3.The plan shall include means for early fire detection and reporting to the public fire department; and facilities needed by the fire department for fire extinguishment including a water supply and fire hydrants.~~

~~4.Fire apparatus access roads around the piles and access roads to the top of the piles shall be established, identified and maintained.~~

~~5.Regular yard inspections by trained personnel shall be included as part of an effective fire prevention maintenance program.~~

~~Additional fire protection called for in the plan shall be provided and shall be installed in accordance with this code. The increase of the pile size shall be based on the capabilities of the installed fire protection systems and features.~~

2808.3.1 Increase in Pile or Stack size. Piles or stackable products are permitted to be increased beyond the dimensions in Section 2808.3 provided a written fire protection plan is *approved* by the *fire code official*. The fire protection plan shall include, but not be limited to, the following:

1.Contact information for after-hours response by facility personnel.

2.Storage yard areas and material-handling equipment selection, pile design and arrangement shall be based upon sound safety and fire protection principles.

3.Fire apparatus access roads around the piles or stacks and access roads to the top of piles, if applicable, shall be established, identified, and maintained.

4.The potential for spontaneous heating shall be evaluated and provisions made to control the temperature of the piles. Methods for monitoring the internal temperature of the pile shall be provided.

5.Routine yard inspections shall be conducted by trained personnel.

6.A means for early fire detection and reporting to the public fire department shall be provided.

7.Facilities and equipment needed by the fire department for fire extinguishment shall be provided, including a water supply in compliance with Section 507 and heavy equipment necessary to move material.

8.A de-inventory plan shall be utilized to remove alternating piles or stacked products in a manner to increase the separation distances between the remaining piles or stacks.

9.The increased pile size shall be based upon the capabilities of the installed *fire protection systems* and features.

10.A controlled burn area shall be provided on the site for smoldering or damaged product.

2808.4 Pile separation. Piles or stacked product shall be separated from buildings, property lines and adjacent piles ~~by approved fire apparatus access roads.~~ or stacks by a distance of not less than one and one-half times the height of the pile or stack. The distance between rows shall be a minimum of 30 feet (9144 mm) . *Approved* fire apparatus access roads shall be provided within the separation space in accordance with Section 503.

2810.1 General. The outside storage of wood pallets and wood composite pallets on the same site as a pallet manufacturing or pallet recycling facility shall comply with Sections 2810.2 through 2810.11.

2810.2 Site plan. Each site shall maintain a current site ~~plan that includes a general description of the property, the boundaries of the lot, the size and location of buildings,~~ plan. The site plan shall be submitted to the *fire code official* for approval and contain all of the following:

1.Lot Lines

2.Utilities.

3.~~Type~~Size, location, and type of construction ~~and presence of sprinkler protection for other~~ of the buildings on the ~~site~~ property.

4.Presence of *fire protection systems*.

5.Water supply sources for fire-fighting purposes.

6.Location of hazardous material storage areas.

7.Location of pallet storage.

8.Equipment protected with a dust collection system.

9.Fire apparatus access roads.

10.Designated smoking areas.

11.Location of fire alarm control panels.

2810.3 Fire prevention plan. The owner or owner's authorized representative shall ~~prepare an approved~~ submit a fire prevention plan for review and approval by the *fire code official* that includes all of the following:

1.Frequency of walk-through inspections to verify compliance with the plan.

2.Hot work permit program in accordance with Chapter 35.

3.Preventive maintenance program for equipment associated with pallet activities.

4.Inspection, testing and maintenance of fire protection systems in accordance with Chapter 9.

2810.4 Fire safety and ~~emergency~~ evacuation plan. The owner or owner's authorized representative shall prepare and train employees in an approved fire safety and ~~emergency~~ evacuation plan in accordance with Chapter 4.

2810.10 Portable fire extinguishers. Portable fire extinguishers shall be ~~provided within 75 feet (22 860 mm) of any pallet stack~~ selected, installed and maintained in accordance with Section 906.

2810.11 Alternative approach. Where approved by the fire code official, pallet stacks are permitted to be located closer to a property line or structure than as required by Sections 2810.6 and 2810.7 ~~shall be provided with~~, where additional fire protection is provided, including, but not limited to, the following:

1. 1.The storage yard areas and materials-handling equipment selection, design, and arrangement are based on an approved risk assessment.
2. 2.Automatic fire detection that transmits an alarm to a supervising station in accordance with NFPA 72.
3. 3.Fire apparatus access roads around all storage areas.

CHAPTER 30 INDUSTRIAL OVENS

3006.1 Required protection. Class A and B ovens that contain, or are utilized for the processing of, combustible materials shall be protected by an approved automatic fire-extinguishing system complying with Chapter 9.

Exceptions:

1.Small tabletop ovens used in laboratory facilities.

2.Non walk-in ovens that are less than 4 feet (1219 mm) in length and width.

CHAPTER 31 TENTS, TEMPORARY SPECIAL EVENT STRUCTURES AND OTHER MEMBRANE STRUCTURES

3101.1 Scope. Tents, temporary special event structures and *membrane structures* shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary tents *and membrane structures*. The provisions of Sections 3104 and ~~3106~~ 3108 are applicable to temporary and permanent tents and membrane structures. The provisions of Section 3105 are applicable to temporary special event structures. The provisions of Section 3106 are applicable to inflatable amusement devices. The provisions of Section ~~3106~~ 3107 are applicable to outdoor assembly events. Other temporary structures shall comply with the *International Building Code*.

~~[NY]~~**3103.2 Approval required.** *Tents* and *membrane structures* required to have a permit as set forth in Sections 105.5 and 105.6 ~~having an area in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

~~Exceptions:~~

~~1. Tents used exclusively for recreational camping purposes.~~

2. Tents open on all sides that comply with all of the following:

2.1. Individual tents having a maximum size of 700 square feet (65 m).

2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m) total.

2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

[NY]3103.4 Permits. Permits shall be required as set forth in Sections 105.2 and 105.6.

3103.3.1 Special amusement building. area. Tents and other membrane structures erected as a special amusement building area shall be equipped with an automatic sprinkler system in accordance with Section 914.7.1411.3 of the International Building Code.

3103.65 Construction documents. A detailed site and floor plan for *tents* or *membrane structures* with an *occupant load* of 50 or more shall be provided with each application for approval. The *tent* or *membrane structure* floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment. The *construction documents* shall include an analysis of structural stability. Water filled vessels used to anchor a *tent* or *membrane structure* shall be in accordance with Section 3103.8.1.

3103.8.1 Water Filled Vessels. Water filled vessels shall be permitted to be used where *approved* and in accordance with the *tent* or *membrane structure* manufacturer's load specifications.

3104.2 Flame propagation performance treatment testing and certification. Before a permit is granted, the owner or agent shall file with the fire code official a certificate executed provided by the product manufacturer to verify that the materials have been tested and certified by an approved testing laboratory. The certificate shall indicate that the floor coverings, tents, membrane structures and their appurtenances, which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701, as applicable. Alternatively, the materials shall be treated with a flame retardant in an approved manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701. The certificate shall indicate compliance with the testing requirements of NFPA 701, Chapter 16. The flame propagation performance criteria shall be effective for the period specified by the permit.

3104.3 Label. *Membrane structures* or *tents* shall have a permanently affixed label bearing the following information:

1. The identification of size and fabric or material.

2. The names and addresses of the manufacturers of the *tent* or air-supported structure.

3. A statement that the fabric or material meets the requirements of Section 3104.2.

4. If treated, the date when a flame retardant treatment was last applied to the fabric or material, the trade name or kind of chemical used in treatment, name of person or firm treating the fabric or material, and name of testing agency and test standard by which the fabric or material was tested.

5. If untreated, a statement that no treatment was applied when the fabric or material met the requirements of Section 3104.2.

3104.4 Certification Affidavit. The affidavit required by Section 3104.2 shall contain all of the information specified in Section 3104.3. An affidavit or affirmation shall be submitted to the fire code official and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to all of the following information relative to the flame propagation performance criteria of the fabric:

1. Names and address of the owners of the tent or air-supported structure.

2. Date the fabric was last treated with flame-retardant solution.

3. Trade name or kind of chemical used in treatment.

4. Name of person or firm treating the material.

5. Name of testing agency and test standard by which the fabric was tested.

3105.2 Approval. Temporary special event structures required to have a permit as set forth in Sections 105.5 and 105.6 ~~in excess of 400 square feet (37 m^2)~~ shall not be erected, operated or maintained for any purpose without first obtaining approval and a permit from the fire code official and the building official.

~~**[NY] 3105.3 Permits.** Permits shall be required as set forth in Sections 105.5 and 105.6.~~

SECTION 3106 INFLATABLE AMUSEMENT DEVICES.

3106.1 Scope. Inflatable amusement devices shall comply with this Section.

Exception: Inflatable amusement devices operated on private property where use is not open to the public.

3106.2 General. Inflatable amusement devices shall be designed, anchored, operated and maintained in accordance with the manufacturer's instructions and the requirements of ASTM F2374.

3106.3 Combustible Materials. The materials used in the construction of the inflatable amusement device shall meet the flame propagation criteria of Test Method 2 of NFPA 701. Additionally, a label and affidavit containing the information required in Sections 3104.3 and 3104.4 of this code shall be permanently affixed to the device.

3106.4 Electrical equipment and wiring. Electrical equipment, blower motors and temporary wiring for electrical power or lighting shall comply with Section 603.

3106.5 Portable generators. Portable generators shall comply with the applicable provisions of NFPA 70 and with the portable generator requirements of this code.

3106.6 Portable Fire Extinguishers. Each generator shall be provided with an *approved* portable fire extinguisher complying with Section 906 that is placed in an *approved* location.

~~**[NY]** **3106**~~**7.2.2 Permits.** An operational permit shall be required as set forth in Section 105.~~6~~5.

3106~~**6**~~**7.5.1 Separation from tents or structures.** Cooking ~~appliances or devices~~ operations shall be in compliance with Section 3108.12~~. that produce sparks or grease-laden vapors or flying embers (firebrands) shall not be used within 20 feet (6096 mm) of a tent or temporary structure~~.

~~**Exceptions:**~~

~~1. Designated cooking tents not occupied by the public when approved by the fire code official.~~

~~2. Tents or structures where cooking appliances are protected with an automatic fire-extinguishing system in accordance with Section 904.13.~~

3107~~**8**~~**.4 Open or exposed flame.** Open flame or other devices emitting flame, fire or heat or any *flammable* or *combustible liquids*, gas, charcoal ~~or other cooking device~~ or any other unapproved devices shall not be permitted inside or located within ~~20~~ 10 feet (~~6096~~ 3048 mm) of the tent or membrane structures while open to the public unless approved by the fire code official.

Exception: Cooking devices shall comply with section 3108.12

3107~~**8**~~**.12 Heating and cooking equipment.** Temporary ~~H~~heating and cooking equipment shall be in accordance with Chapter 41. Permanent heating and cooking equipment shall be in accordance with Chapter 6 and Sections 3107~~8~~.12.1 through 3107~~8~~.12.~~7~~3.

3107~~**8**~~**.14.1 Batteries.** Batteries shall be disconnected ~~in an appropriate manner.~~ except where the *fire code official* requires that the batteries remain connected to maintain safety features.

CHAPTER 32 HIGH-PILED COMBUSTIBLE STORAGE

3201.3 Construction documents. At the time of building permit application for new structures designed to accommodate high-piled storage or for requesting a change of occupancy/use, and at the time of application for a storage permit, plans and specifications shall be submitted for review and approval. In addition to the information required by the International Building Code, the storage permit submittal shall include the information specified in this section. The construction documents shall include all of the following:

1. Floor plan of the building showing locations and dimensions of high-piled storage areas.
2. Usable storage height for each storage area.
3. Number of tiers within each rack, if applicable.
4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
5. Aisle dimensions between each storage array.
6. Maximum pile volume for each storage array.
7. Location and classification of commodities in accordance with Section 3203.
8. Location of commodities that are banded or encapsulated.
9. Location of required fire department access doors.
10. Type of fire ~~suppression and fire detection~~ protection systems.
11. Location of valves controlling the water supply of ceiling and in-rack sprinklers.
12. Type, location and specifications of smoke removal and curtain board systems.
13. Dimension and location of transverse and longitudinal flue spaces.
14. Additional information regarding required design features, commodities, storage arrangement and fire protection features within the high-piled storage area shall be provided at the time of permit, where required by the fire code official.

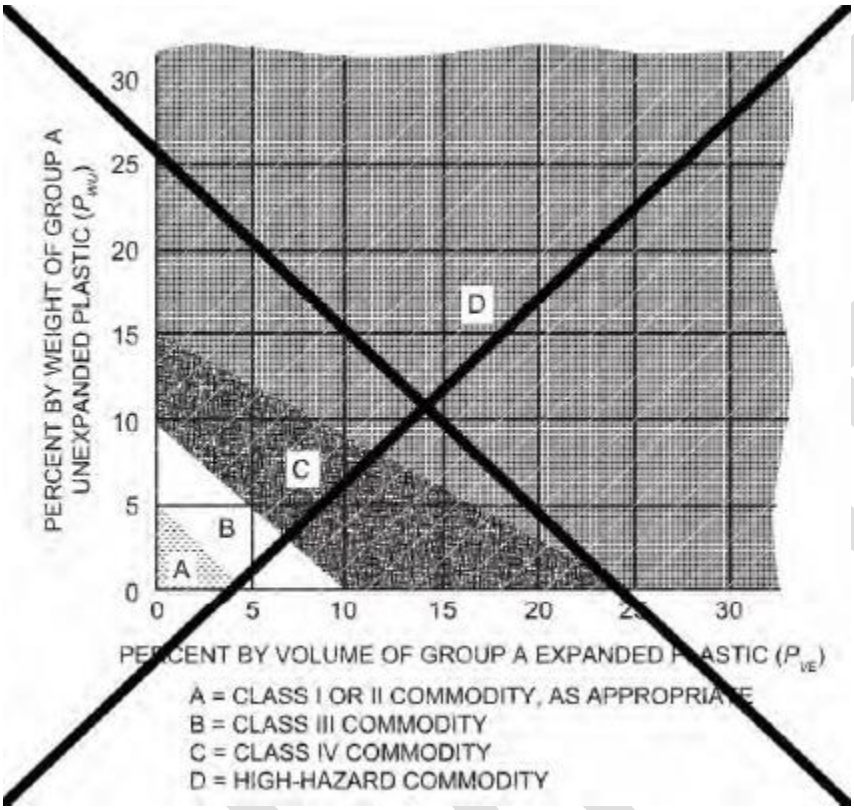
TABLE 3203.8 EXAMPLES OF COMMODITY CLASSIFICATION

Portions of the body of the table which were unchanged are not shown.

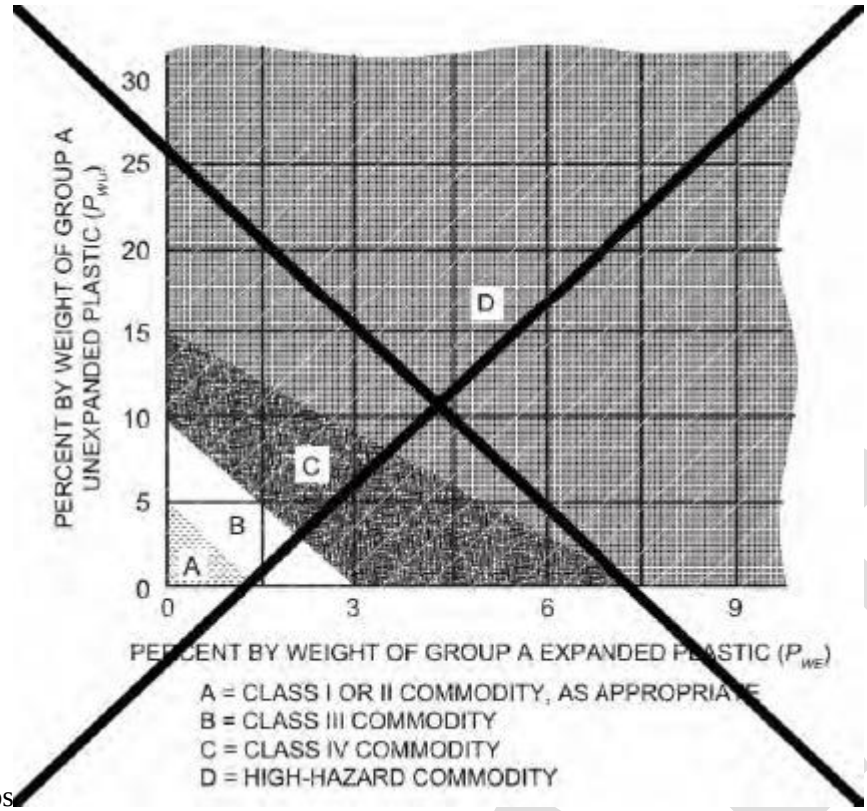
PRODUCT CATEGORY	PRODUCT	CLASSIFICATION
Aerosols	Level 1	Class III (See Chapter 51)
	Level 2	Class IV (See Chapter 51)
	Level 3	High-hazard (See Chapter 51)
Batteries	Dry cells (excludes lithium, lithium-ion and other similar exotic metals or combustible electrolyte); without blister packing (if blister packed, refer to the commodity classification definitions)	Class I
	Dry cells (nonlithium or similar exotic metals); in blister packing; cartoned	Class II
	Vehicle; any size (for example, automobile or truck); empty plastic casing	High-hazard (Group A unexpanded)

	Vehicle; large (in other words, truck or larger); dry or wet cells (excludes lithium-ion and other cells containing combustible electrolytes)	High-hazard (Group A unexpanded)
	Vehicle; small (for example, automobile); wet cells (excludes lithium-ion and other cells containing combustible electrolytes)	Class I
	Lithium-ion	High-hazard

For SI: 1 inch = 25.4 mm, 1 gallon = 3.8 L, 1 ounce = 29.57 ml.

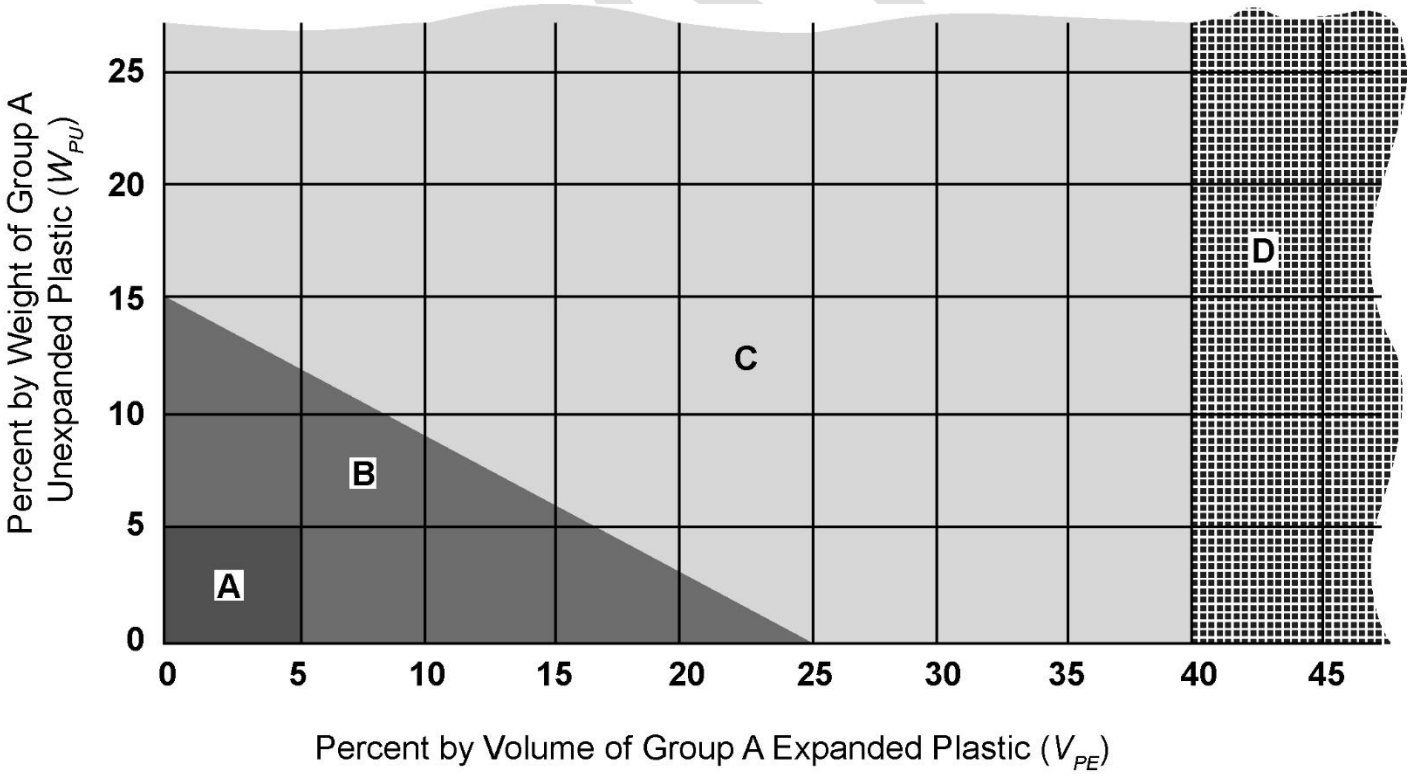


~~**FIGURE 3203.9(1) EVALUATION BY VOLUME OF GROUP A EXPANDED PLASTICS IN MIXED COMMODITIES[a, b]**~~



apps

~~FIGURE 3203.9(2) EVALUATION BY WEIGHT OF GROUP A EXPANDED PLASTICS IN MIXED COMMODITIES[a, b, c]~~



A = Class I, II or III commodity
B = Class IV commodity
C = High-hazard commodity (Group A Unexpanded)
D = High-hazard commodity (Group A Expanded)

FIGURE 3203.9(1) EVALUATION OF CARTONED COMMODITIES CONTAINING GROUP A PLASTICS[a, b]

a. This figure is used to determine the commodity classification of a mixed commodity with Group A plastics in a package or crate.

b. The following is an example of how to apply Figure 3203.9(1): A pallet load consists of a Class III commodity in cardboard boxes with components of unexpanded Group A plastic and packing material of expanded Group A plastic. Using Equation 32-1, the weight of unexpanded Group A plastic is 5 percent. Using Equation 32-2, the volume of expanded Group A plastic is 15 percent. This commodity is classified as a Class IV commodity. If the volume of the expanded Group A plastic is increased to 20 percent, the classification changes to a high-hazard (Group A unexpanded) commodity. Where the load is stored on a plastic pallet, the requirements in Section 3203.10 also apply.

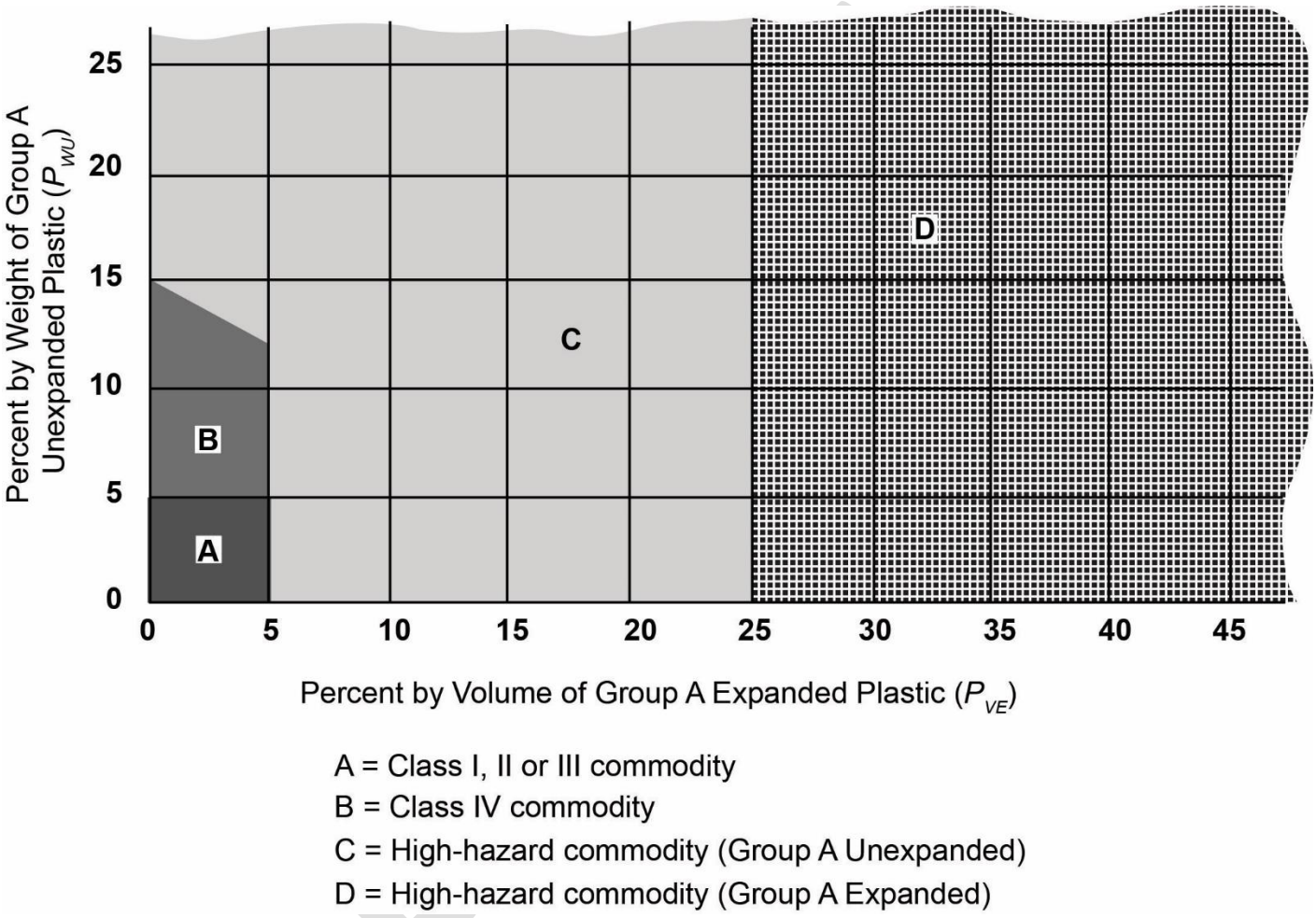


FIGURE 3203.9(2) EVALUATION OF EXPOSED COMMODITIES CONTAINING GROUP A PLASTICS[a, b]

a. This figure is used to determine the commodity classification of a mixed commodity with Group A plastics where the products are exposed.

b. The following is an example of how to apply Figure 3203.9(2): A pallet load consists of an exposed Class III commodity with components of unexpanded Group A plastic and packing material of expanded Group A plastic. Using Equation 32-1, the weight of unexpanded Group A plastic is 5 percent. Using Equation 32-2, the volume of expanded Group A plastic is 6 percent. This commodity is classified as a high-hazard (Group A unexpanded) commodity. Where the load is stored on a plastic pallet, the requirements in Section 3203.10 also apply.

3204.2 Designation based on engineering analysis. The designation of a *high-piled combustible storage area*, or portion thereof, is allowed to be based on a lower hazard class than that of the highest class of commodity stored where

a limited quantity of the higher hazard commodity has been demonstrated by engineering analysis to be adequately protected by the *automatic sprinkler system* provided. The engineering analysis shall consider the ability of the *automatic sprinkler system* to deliver the higher density required by the higher hazard commodity. The higher density shall be based on the actual storage height of the pile or rack and the minimum allowable design area for sprinkler operation as set forth in the density/area figures provided in NFPA 13. The contiguous area occupied by the higher hazard commodity shall not exceed 120 square feet (11 m^2) and additional areas of higher hazard commodity shall be separated from other such areas by 25 feet (7620 mm) or more. The automatic sprinkler system shall be capable of delivering the higher density over a minimum area of 900 square feet (84 m^2) for wet pipe systems and 1,200 square feet (111 m^2) for dry pipe systems. The shape of the design area shall be in accordance with Section 903.

3205.1 Storage layout plan maintenance. The *approved* storage layout shall be verified and evaluated annually in accordance with Section 3201.3.2. Modifications or changes to the provisions of the *approved* storage layout shall not be made without prior approval of the *fire code official*.

3205.5 Aisle maintenance. When restocking is not being conducted, aisles shall be kept clear of storage, waste material and debris. Fire department access doors, aisles and exit doors shall not be obstructed. During restocking operations using manual stocking methods, a minimum unobstructed aisle width of 24 inches (610 mm) shall be maintained in 48-inch (1219 mm) or smaller aisles, and a minimum unobstructed aisle width of one-half of the required aisle width shall be maintained in aisles greater than 48 inches (1219 mm). During mechanical stocking operations, a minimum unobstructed aisle width of 44 inches (1118 mm) shall be maintained in accordance with Section 3206.10.

> **Exception:** In high-piled single- and double-row stack storage of combustible materials protected by *automatic sprinkler systems* designed and installed in accordance with the requirements of NFPA 13 governing the use of K-25.2 (360) sprinklers, displays and wing stacks not exceeding 48-inches in height provided they do not obstruct or reduce the clear width of the aisle to less than 48-inches (1219 mm).

TABLE 3206.2

GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

The body of the table is unchanged and omitted for clarity. Changes to footnotes are shown below.

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 m^3, 1 square foot = 0.0929 m^2.

a. Where automatic sprinklers are required for reasons other than those in Chapter 32, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with Sections 3207 and 3208.

b. For aisles, see Section 3206.10.

c. Piles shall be separated by aisles complying with Section 3206.10.

d. For storage in excess of the height indicated, special fire protection shall be provided in accordance with Note f where required by the fire code official. See Chapters 51 and 57 for special limitations for aerosols and flammable and combustible liquids, respectively.

e. For storage exceeding 30 feet in height, Option 1 shall be used.

f. Special fire protection provisions including, but not limited to, fire protection of exposed steel columns; increased sprinkler density; additional in-rack sprinklers, without associated reductions in ceiling sprinkler density; or ~~additional~~ fire department hose connections shall be provided where required by the fire code official.

g. Not required where an automatic fire-extinguishing system is designed and installed to protect the high-piled storage area in accordance with Sections 3207 and 3208.

h. Not required where storage areas are protected by either early suppression fast response (ESFR) sprinkler systems or control mode special application sprinklers with a response time index of 50 $(m \cdot s)^{1/2}$ or less that are listed to control a fire in the stored commodities with 12 or fewer sprinklers, installed in accordance with NFPA 13.

i. Not required in frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.

3206.3.1 Size of high-piled storage area. The size of each high-piled storage area shall include the footprint of the actual high-piled storage racks, shelves or piles and the following aisles:

1. Interior aisles within the footprint of the storage area.
2. An aisle around the perimeter of the footprint with a minimum width as required in Section 3206.10.1 or the dimension to a ~~wall or~~ full height wall, whichever is less.

3206.10.1.1 Sprinklered buildings. Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are ~~accessible~~ open to the public and designated to contain high-hazard commodities.

Aisles shall be not less than 96 inches (2438 mm) wide in areas open to the public where mechanical stocking methods are used.

Exceptions:

1. Aisles in *high-piled storage areas* exceeding 2,500 square feet (232 m) in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by an automatic sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches (1118 mm) wide.

2. Aisles that are in *high-piled storage areas* exceeding 2,500 square feet (232 m) in area, not open to the public and protected by an automatic sprinkler system designed for multiple-row racks, shall be not less than 24 inches (610 mm) wide.

3208.1.1 Storage Racks. The design and installation of storage racks shall be in accordance with the *International Building Code*.

3208.3 Flue spaces. Rack storage areas protected with an *automatic sprinkler system* shall be provided with flue spaces in accordance with Table 3208.3. The space taken by rack uprights that is not obstructed by commodities or solid shelving is allowed to be included in the transverse flue space measurement. Required flue spaces shall be maintained.

3209.4 Automated rack storage. High-piled storage areas with automated rack storage shall be provided with a manually activated emergency shutdown switch ~~for use by emergency personnel. The switch shall be clearly identified and shall be in a location approved by the fire code official~~ and automatic shutdown in accordance with Sections 3209.4.1 and 3209.4.2.

3209.4.1 Manual activated shutdown. A manually activated switch shall be provided to initiate the *approved* automatic shutdown process. The switch shall be clearly identified and shall be in a location *approved* by the *fire code official*.

3209.4.2 Automatic shutdown. Automatic shutdown shall be required for *high-piled combustible storage* areas greater than 500 square feet (46 m^2). The *approved* automatic shutdown process shall commence upon any of the following events:

1.Water flow is detected in the *automatic sprinkler system*, if present.

2.Activation of the fire detection system, if present.

3210.1 General. Records storage facilities used for the rack or shelf storage of combustible paper records greater than 12 feet (3658 mm) in height shall be in accordance with Sections 3206 and ~~3208 and NFPA 13~~ 3208. Palletized storage of records shall be in accordance with Section 3207.

3210.1.1 Alternative Fire Protection. The design and installation of automatic fire extinguishing systems in archives, vaults, and record storage rooms shall be in accordance with NFPA 232.

CHAPTER 33 FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION ~~3308~~ 3303 ~~OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~ ADMINISTRATIVE SAFETY CONTROLS.

~~3308.1~~ 3303.1 **Program development and maintenance.** The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of ~~a~~ an approved written *site safety plan* establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan ~~shall~~ addresses the requirements of this chapter and other applicable portions of this code, the duties of staff, and staff training requirements. The plan shall be submitted and *approved* before a building permit is issued. Any changes to the plan shall be ~~made available for review by the fire code official upon request~~ submitted for approval.

3303.1.1 Components of site safety plans. *Site safety plans* shall include the following as applicable:

1. Name and contact information of site safety director.
2. Documentation of the training of the site safety director and fire watch personnel.
3. Procedures for reporting emergencies.
4. Fire department vehicle access routes.
5. Location of fire protection equipment, including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policies, designated areas to be used where *approved*, and signage locations in accordance with Section 3305.7.
7. Location and safety considerations for temporary heating equipment.
8. Hot work permit plan.
9. Plans for control of combustible waste material.
10. Locations and methods for storage and use of *flammable* and *combustible liquids* and other hazardous materials.
11. Provisions for site security and, where required, for a fire watch.
12. Changes that affect this plan.
13. Other site-specific information required by the *fire code official*.

~~3308.2~~ 3303.2 ~~**Program superintendent.**~~ **Site safety director.** The owner shall designate a person to be the ~~fire prevention program superintendent~~ site safety director. The site safety director ~~who~~ shall be responsible for ~~the fire prevention program and ensure that it is carried out through completion of the project. The fire prevention program superintendent~~ ensuring compliance with the *site safety plan*. The ~~fire prevention program superintendent~~ site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the ~~superintendent~~ site safety director shall be responsible for the guard service.

~~3308.4~~ 3303.2.1 **Training.** Training of fire watch and other responsible personnel in the use of fire protection equipment shall be the responsibility of the ~~fire prevention program superintendent~~ site safety director. Records of training shall be kept and made a part of the written plan for the ~~prevention program~~ *site safety plan*.

3303.3 Daily fire safety inspection. The site safety director shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on-site until a certificate of occupancy has been issued. Documentation shall be immediately available on-site for presentation to the *fire code official* upon request.

1. Any contractors entering the site to perform hot work each day have been instructed in the hot work safety requirements in Chapter 35, and hot work is performed only in areas *approved* by the site safety director.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.

3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. *Flammable liquids* and other hazardous materials are stored in locations that have been *approved* by the site safety director when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3311 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet (6096 mm).
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service *automatic sprinkler systems* are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3307.2.
10. Portable fire extinguishers are available in locations required by Sections 3305.10.2 and 3306.6.
11. Where a fire watch is required in accordance with Section 3305.5, fire watch records required by that section are up-to-date.

3303.3.1 Violations. Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 113.1 and shall result in the issuance of a notice of violation to the site safety director in accordance with Section 113.3. Upon the third offense, the *fire code official* is authorized to issue a stop work order in accordance with Section 114, and work shall not resume until satisfactory assurances of future compliance have been presented to and *approved* by the *fire code official*.

~~**3308.3**~~ **3303.4** ~~**Prefire plans.**~~ **Qualifications.** ~~The fire prevention program superintendent shall develop and maintain an approved prefire plan in cooperation with the fire chief. The fire chief and the fire code official shall be notified of changes affecting the utilization of information contained in such prefire plans.~~ Site safety directors shall acquire training specific to their roles and responsibilities. Upon request, the training and qualifications of the site safety director shall be submitted to the *fire code pfficial* for approval.

~~*3304.5*~~ **3303.5 Fire watch.** Where required by the *fire code official* or the *site safety plan* established in accordance with Section 3303.1, a fire watch shall be provided for building demolition and for building construction.

~~**3304.5.1**~~ **3303.5.1 Fire watch during construction.** A fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade at any point along the building perimeter, for new multistory construction with an aggregate area exceeding 50,000 square feet (4645 m^2) per story or as required by the *fire code official*.

~~**3304.5.2**~~ **3303.5.2 Fire watch personnel.** ~~Trained personnel shall be provided to serve as an on-site fire watch.~~ Fire watch personnel shall be provided in accordance with this section. ~~with not fewer than one approved means for notification of the fire department, and the sole duty of such personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable. Fire watch personnel shall be trained in the use of portable fire extinguishers.~~

~~**3304.5.2.1**~~ **3303.5.2.1 Duties.** The primary duty of fire watch personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable.

~~**3304.5.2.2**~~ **3303.5.2.2 Training**. Personnel shall be trained to serve as an on-site fire watch. Training shall include the use of portable fire extinguishers. Fire extinguishers and fire reporting shall be in accordance with Section 3303.6.

~~**3304.5.2.3**~~ **3303.5.2.3 Means of notification**. Fire watch personnel shall be provided with not fewer than one *approved* means for notifying the fire department.

~~**3304.5.3**~~ **3303.5.3 Fire watch location and records.** The fire watch shall include areas specified by the ~~prefire~~ *site safety plan* established in accordance with Section 3303. ~~3308.3. The fire watch personnel shall keep a record of all time periods of duty, including a log entry each time the site was patrolled and each time a structure under construction was entered and inspected. The records and log entries shall be made available for review by the fire code official upon request.~~

3303.5.4 **Fire watch records.** Fire watch personnel shall keep a record of all time periods of duty, including the log entry for each time the site was patrolled and each time a structure was entered and inspected. Records shall be made available for review by the *fire code official* upon request.

~~3309.1~~ 3303.6 **Emergency telephone.** Emergency telephone facilities with *ready access* shall be provided in an *approved* location at the construction site, or an *approved* equivalent means of communication shall be provided. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone. Alternatively, where an equivalent means of communication has been *approved*, the site address and fire department emergency telephone number shall be posted at the main entrance to the site, in guard shacks and in the construction site office.

SECTION 3304 ~~PRECAUTIONS AGAINST FIRE~~ PROTECTION OF COMBUSTIBLE MATERIALS.

~~3304.2~~ 3304.1 **Combustible debris, rubbish and waste.** Combustible debris, rubbish and waste material shall comply with the requirements of Sections 3304.~~2~~1.1 through 3304.2~~.4~~.

~~3304.2.1~~ 3304.1.1 **Combustible waste material accumulation.** Combustible debris, rubbish and waste material shall not be accumulated within buildings.

~~3304.2.2~~ 3304.1.2 **Combustible waste material removal.** Combustible debris, rubbish and waste material shall be removed from buildings at the end of each shift of work.

~~3304.2.3~~ 3304.1.3 **Rubbish containers.** Where rubbish containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) are used for temporary storage of combustible debris, rubbish and waste material, they shall have tight-fitting or self-closing lids. Such rubbish containers shall be constructed entirely of materials that comply with either of the following:

1. Noncombustible materials.
2. Materials that meet a peak rate of heat release not exceeding 300 kW/m when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m in the horizontal orientation.

~~3304.2.4~~ 3304.2 **Spontaneous ignition.** Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a *listed* disposal container.

SECTION ~~3303~~ 3305 ~~TEMPORARY HEATING EQUIPMENT~~ IGNITION SOURCE CONTROLS.

~~3303.1~~ 3305.1 **Listed.** Temporary heating devices shall be *listed* and *labeled*. The installation, maintenance and use of temporary heating devices shall be in accordance with the listing and the manufacturer's instructions.

~~3303.2~~ 3305.1.1 **Oil-fired heaters.** Oil-fired heaters shall comply with Section 605.

~~3303.3~~ 3305.1.2 **LP-gas heaters.** Fuel supplies for liquefied-petroleum gas-fired heaters shall comply with Chapter 61 and the *International Fuel Gas Code*.

~~3303.4~~ 3305.1.3 **Refueling.** Refueling operations for liquid-fueled equipment or appliances shall be conducted in accordance with Section 5705. The equipment or appliance shall be allowed to cool prior to refueling.

~~3303.5~~ 3305.1.4 **Installation.** Clearance to combustibles from temporary heating devices shall be maintained in accordance with the *labeled* equipment. When in operation, temporary heating devices shall be fixed in place and protected from damage, dislodgement or overturning in accordance with the manufacturer's instructions.

~~3303.6~~ 3305.1.5 **Supervision.** The use of temporary heating devices shall be supervised and maintained only by competent personnel.

~~3304.1~~ 3305.2 **Smoking.** Smoking shall be prohibited except in *approved* areas. Signs shall be posted in accordance with Section 310. In *approved* areas where smoking is permitted, *approved* ashtrays shall be provided in accordance with Section 310.

3304~~4~~5.3 Burning of combustible debris, rubbish and waste. Combustible debris, rubbish and waste material shall not be disposed of by burning on the site unless *approved*.

3304~~4~~5.4 Open burning. *Open burning* shall comply with Section 307.

~~3304.6~~ 3305.5 **Cutting and welding.** Welding, cutting, open torches and other hot work operations and equipment shall comply with Chapter 35.

~~3304.7~~ 3305.6 **Electrical.** Temporary wiring for electrical power and lighting installations used in connection with the construction, alteration or demolition of buildings, structures, equipment or similar activities shall comply with NFPA 70.

~~3304.8~~ 3305.7 **Cooking.** Cooking shall be prohibited except in *approved* designated cooking areas separated from combustible materials by a minimum of 10 feet (3048 mm). Signs with a minimum letter height of 3 inches (76 mm) and a minimum brush stroke of $^1/_2$ inch (13 mm) shall be posted in conspicuous locations in designated cooking areas and state:

DESIGNATED COOKING AREA

COOKING OUTSIDE OF A DESIGNATED

COOKING AREA IS PROHIBITED

3305.8 General. Portable generators used at construction and demolition sites shall comply with Section 1204.

3305.9 Hot work operations. The site safety director shall ensure hot work operations and permit procedures are in accordance with Chapter 35.

~~**SECTION 3317 SAFEGUARDING ROOFING OPERATIONS**~~

~~**3318.1**~~ **3305.10 Safeguarding roof operations** ~~**General.**~~ Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections ~~3317.2~~ 3305.10.1 and ~~3317.3~~ 3305.10.2 and Chapter 35.

~~**3318.2**~~ **3305.10.1 Asphalt and tar kettles.** Asphalt and tar kettles shall be operated in accordance with Section 303.

~~**3318.3**~~ **3305.10.2 Fire extinguishers for roofing operations.** Fire extinguishers shall comply with Section 906. There shall be not less than one multiple-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating on the roof being covered or repaired.

SECTION 3306 FIRE PROTECTION SYSTEMS AND DEVICES

~~**3308.5**~~ **3306.1 Fire protection devices.** The site safety director shall ensure that all fire protection equipment is maintained and serviced in accordance with this code. ~~The quantity and type of fire protection equipment shall be approved. Fire protection equipment shall be inspected in accordance with the fire protection program.~~

~~**3308.7**~~ **3306.2 Impairment of fire protection systems.** The site safety inspector shall ensure ~~I~~impairments to any fire protection system shall be in accordance with Section 901.

~~**3308.7.1**~~**3306.3 Smoke detectors and smoke alarms.** Smoke detectors and smoke alarms located in an area where airborne construction dust is expected shall be covered to prevent exposure to dust or shall be temporarily removed. Smoke detectors and alarms that were removed shall be replaced upon conclusion of dust-producing work. Smoke detectors and smoke alarms that were covered shall be inspected and cleaned, as necessary, upon conclusion of dust-producing work.

~~**3308.8**~~ **3306.4 Temporary covering of fire protection devices.** Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

~~**SECTION 3314 AUTOMATIC SPRINKLER SYSTEM.**~~

~~**[NY] 3314.1**~~ **3306.5 Automatic Sprinkler system.** ~~**Completion before occupancy.**~~ In buildings where an *automatic sprinkler system* is required by this code or the *International Building Code*, it shall be unlawful to occupy any portion of a building or structure until the *automatic sprinkler system* installation has been tested and approved, except as provided in Section 105.3.4.

~~**3314.2**~~ **3306.5.1 Operation of valves.** Operation of sprinkler control valves shall be allowed only by properly authorized personnel and shall be accompanied by notification of duly designated parties. Where the sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at the end of each work period to ascertain that protection is in service.

~~**SECTION 3315 PORTABLE FIRE EXTINGUISHERS.**~~

~~**3315.1**~~ **3306.6** ~~**Where required.**~~ **Portable fire extinguishers.** Structures under construction, *alteration* or demolition shall be provided with not less than one *approved* portable fire extinguisher in accordance with Section 906 and sized for not less than ordinary hazard as follows:

1. At each *stairway* on all floor levels where combustible materials have accumulated.
2. In every storage and construction shed.
3. Additional portable fire extinguishers shall be provided where special hazards exist including, but not limited to, the storage and use of *flammable* and *combustible liquids*.

SECTION ~~**3310**~~ **3307** ~~**ACCESS FOR FIRE FIGHTING**~~ **FIRE DEPARTMENT SITE ACCESS AND WATER SUPPLY.**

~~**3310.1**~~ **3307.1 Required access.** *Approved* vehicle access for fire fighting shall be provided to all construction or demolition sites. Vehicle access shall be provided to within 100 feet (30 480 mm) of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions. Vehicle access shall be maintained until permanent fire apparatus access roads are available.

~~**3310.2**~~ **3307.1.1 Key boxes.** Key boxes shall be provided as required by Chapter 5.

~~**SECTION 3311 MEANS OF EGRESS.**~~

~~**3311.1**~~ **3307.1.2 Stairways required.** Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided. As construction progresses, such *stairway* shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~**3311.2**~~ **3307.1.3 Maintenance.** Required *means of egress* and required *accessible means of egress* shall be maintained during construction and demolition, remodeling or alterations and additions to any building.

Exception: *Approved* temporary *means of egress* and *accessible means of egress systems* and facilities.

~~**SECTION 3312 WATER SUPPLY FOR FIRE PROTECTION.**~~

~~**3312.1**~~ **3307.2** ~~**When required**~~ **Water supply for fire protection.** An approved water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction and on installation of a standpipe system in buildings under construction, in accordance with Sections 3307.2.1 through 3307.4.

Exception: The *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

3307.2.1 Combustible building materials. When combustible building materials of the building under construction are delivered to a site, a minimum fire flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used to provide this fire-flow supply shall be within 500 feet (152 m) of the combustible building materials, as measured along an *approved* fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 500 feet (152 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

3307.2.2 Vertical construction of Types III, IV and V construction. Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Sections 3307.2.2.1 through 3307.2.2.3 shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

3307.2.2.1 Fire separation up to 30 feet. Where a building of Type III, IV or V construction has a *fire separation distance* of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide either a minimum of 500 gallons per minute (1893 L/m) or the entire fire flow required for the building when constructed, whichever is greater.

3307.2.2.2 Fire separation of 30 feet up to 60 feet. Where a building of Type III, IV or V construction has a fire separation distance of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide a minimum of 500 gallons per minute (1893 L/m) or 50 percent of the fire flow required for the building when constructed, whichever is greater.

3307.2.2.3 Fire separation of 60 feet or greater. Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property *lot line*, a water supply of 500 gallons per minute (1893 L/m) shall be provided.

3307.3 Vertical construction, Type I and II construction. If combustible building materials are delivered to the construction site, water supply in accordance with Section 3307.2.1 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.

3307.4 Standpipe supply. Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3307.5, a water supply providing a minimum flow of 500 gallons per minute (1893 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

~~**SECTION 3313 STANDPIPES.**~~

~~**3313.1**~~ **3307.5** ~~**Where required**~~ **Standpipes.** In buildings required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed prior to construction exceeding 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipes shall be provided with fire department hose connections at locations adjacent to *stairways* complying with Section 3307.1.2 ~~3311.1~~. As construction progresses, such standpipes shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~**3313.2**~~ **3307.5.1 Buildings being demolished.** Where a building is being demolished and a standpipe is existing within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

~~**3313.3**~~ **3307.5.2 Detailed requirements.** Standpipes shall be installed in accordance with the provisions of Section 905.

> **Exception:** Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes comply with the requirements of Section 905 as to capacity, outlets and materials.

SECTION ~~3316~~ 3308 MOTORIZED CONSTRUCTION EQUIPMENT.

~~**3316.1**~~ **3308.1 Conditions of use.** Internal-combustion-powered construction equipment shall be used in accordance with all of the following conditions:

1. Equipment shall be located so that exhausts do not discharge against combustible material.
2. Exhausts shall be piped to the outside of the building.
3. Equipment shall not be refueled while in operation.
4. Fuel for equipment shall be stored in an **approved** area outside of the building.

SECTION ~~3305~~ 3309 ~~FLAMMABLE AND COMBUSTIBLE LIQUIDS~~ HAZARDOUS MATERIALS.

~~**3305.1**~~ **3309.1 Storage of flammable and combustible liquids.** Storage of *flammable* and *combustible liquids* shall be in accordance with Section 5704.

~~**3305.2**~~ **3309.1.1 Class I and Class II liquids.** The storage, use and handling of *flammable* and *combustible liquids* at construction sites shall be in accordance with Section 5706.2. Ventilation shall be provided for operations involving the application of materials containing flammable solvents.

~~3305.3~~ 3309.1.2 **Housekeeping.** *Flammable* and *combustible liquid* storage areas shall be maintained clear of combustible vegetation and waste materials. Such storage areas shall not be used for the storage of combustible materials.

~~3305.4~~ 3309.1.3 **Precautions against fire.** Sources of ignition and smoking shall be prohibited in flammable and *combustible liquid* storage areas. Signs shall be posted in accordance with Section 310.

~~3305.5~~ 3309.1.4 **Handling at point of final use.** Class I and II liquids shall be kept in *approved* safety containers.

~~3305.6~~ 3309.1.5 **Leakage and spills.** Leaking vessels shall be immediately repaired or taken out of service and spills shall be cleaned up and disposed of properly.

~~**SECTION 3306 FLAMMABLE GASES**~~

~~3306.1~~ 3309.2 **Storage and handling.** The storage, use and handling of flammable gases shall comply with Chapter 58.

~~3306.2~~ 3309.2.1 **Cleaning with flammable gas.** Flammable gases shall not be used to clean or remove debris from piping open to the atmosphere.

~~3306.2.1~~ 3309.2.2 **Pipe cleaning and purging.** The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. Compressed gas piping systems other than fuel gas piping systems where in accordance with Chapter 53.
2. Piping systems regulated by the *International Fuel Gas Code*.
3. Liquefied petroleum gas systems in accordance with Chapter 61.
4. Cleaning and purging of refrigerant piping systems shall comply with the *International Mechanical Code*.

~~**SECTION 3307 EXPLOSIVE MATERIALS**~~

~~3307.1~~ 3309.3 **Storage and handling.** *Explosive* materials shall be stored, used and handled in accordance with Chapter 56.

~~3308.2~~ 3309.3.1 **Supervision.** Blasting operations shall be conducted in accordance with Chapter 56.

~~3308.3~~ 3309.3.2 **Demolition using explosives.** *Approved* fire hoses for use by demolition personnel shall be maintained at the demolition site wherever *explosives* are used for demolition. Such fire hoses shall be connected to an *approved* water supply and shall be capable of being brought to bear on post-*detonation* fires anywhere on the site of the demolition operation.

SECTION 3310 ADDITIONAL SAFEGUARDS FOR OCCUPIED BUILDINGS.

~~3311.3~~ 3310.1 **Storage.** Combustible materials associated with construction, demolition, remodeling or *alterations* to an occupied structure shall not be stored in *exits*, enclosures for *stairways* and *ramps*, or *exit access corridors* serving an occupant load of 30 or more.

Exceptions:

1. Where the only occupants are construction workers.
2. Combustible materials that are temporarily accumulated to support work being performed when workers are present.

SECTION 3311 ADDITIONAL SAFEGUARDS FOR TYPE I & II CONSTRUCTION.

3311.1 Separations between construction areas. Separations used in Type I and Type II construction to separate construction areas from occupied portions of the building shall be constructed of materials that comply with one of the following:

1. Noncombustible materials.

2. Materials that exhibit a flame spread index not exceeding 25 when tested in accordance with ASTM E84 or UL 723.

3. Materials exhibiting a peak heat release rate not exceeding 300 kW/m^2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation on specimens at the thickness intended for use.

SECTION 3312 ADDITIONAL SAFEGUARDS FOR TYPE IV CONSTRUCTION.

3312.1 Fire safety requirements for buildings of Types IV-A, IV-B and IV-C construction. Buildings of Types IV-A, IV-B and IV-C construction designed to be greater than six stories above *grade plane* shall comply with the following requirements during construction unless otherwise *approved* by the *fire code official*:

1. Standpipes shall be provided in accordance with Section 3307.2.

2. A water supply for fire department operations, as *approved* by the *fire code official* and the *fire chief*.

3. Where building construction exceeds six stories above *grade plane* and noncombustible protection is required by Section 602.4 of the *International Building Code*, at least one layer of noncombustible protection shall be installed on all building elements on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

Exceptions:

1. Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

2. Noncombustible material on the top of mass timber floor assemblies shall not be required before erecting additional floor levels.

4. Where building construction exceeds six stories above *grade plane*, required *exterior wall* coverings shall be installed on floor levels, including mezzanines, more than four levels below active mass timber construction before additional floor levels can be erected.

Exception: Shafts and vertical exit enclosures shall not be considered part of the active mass timber construction.

CHAPTER 35 WELDING AND OTHER HOT WORK

3501.3 Restricted areas. Hot work shall only be conducted in areas designed or authorized for that purpose by the personnel responsible for a hot work program. Hot work shall not be conducted in the following areas unless approval has been obtained from the *fire code official*:

1. Areas where the *automatic sprinkler system* is impaired.
2. Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.
3. Areas with readily ignitable materials, such as storage of large quantities of bulk sulfur, baled paper, cotton, lint, dust or loose combustible materials.
4. On board ships at dock or ships under construction or repair.
5. At other locations as specified by the *fire code official*.

3504.3.1 Pre-hot-work check. A pre-hot-work check shall be conducted prior to work to ensure that all equipment is safe and hazards are recognized and protected. A report of the check shall be kept at the work site during the work and available upon request. The pre-hot-work check shall determine all of the following:

1.Hot work equipment to be used shall be in satisfactory operating condition and in good repair.

2.Hot work site is clear of combustibles or combustibles are protected.

3.Exposed construction is of noncombustible materials or, if combustible, then protected.

4.Openings are protected.

5.Floors are kept clean.

6.Exposed combustibles are not located on the opposite side of partitions, walls, ceilings or floors.

7.Fire watches, where required, are assigned.

8.Approved actions have been taken to prevent accidental activation of ~~suppression and detection~~ fire protection system equipment in accordance with Sections 3504.1.8 and ~~3504.1.9.~~3504.1.9.

9.Fire extinguishers and fire hoses (where provided) are operable and available.

CHAPTER 38 HIGHER EDUCATION LABORATORIES

3805.2.1 Restricted materials storage. Where approved by the fire code official, storage of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed within a laboratory control area at 25 percent of Table 5003.1.1(1) limits for a building equipped throughout with an automatic sprinkler system.

1. ~~Pyrophorics~~ Class 4 oxidizers.
2. ~~Class 4 Oxidizers~~ *Pyrophorics*.

The percentage of the *maximum allowable quantity per control area* shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 Oxidizers or *pyrophoric* materials.

Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:

1. Containers shall be completely sealed and stored in accordance with the manufacturers' recommendations.
2. Storage shall be within approved hazardous material storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11.
3. The storage cabinet or glove box shall not contain any storage of incompatible materials.

3805.2.2 Restricted materials use. Where approved by the fire code official, use of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25 percent of Table 5003.1.1(1) limits for buildings equipped throughout with an automatic sprinkler system.

1. ~~Pyrophorics~~ Class 4 *oxidizers*.
2. ~~Class 4 Oxidizers~~ *Pyrophorics.*

The percentage of the *maximum allowable quantity per control area* shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 *oxidizers or pyrophoric* materials.

Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following:

1. Use shall be within an approved chemical fume hood listed in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45, Section 7.11, or other approved equipment designed for the specific hazard of the material.
2. Combustible materials shall be kept not less than 2 feet (610 mm) away from the work area, except for those items directly related to the research.
3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet (6096 mm) of the use in accordance with Section 906.

3805.4 Percentage of maximum allowable quantity per control area. The percentage of maximum allowable quantities per control area of hazardous materials shall ~~be permitted to be increased in accordance~~ comply with Table 3805.4.

TABLE 3805.4 DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NONSPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a,e]	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b,c, d]
Above grade plane	Higher than 9	5	1	2[c]
	7-9	10	2	2[c]
	4-6	25	2	2[c]
	3	75	2	1
	1-2	100	4	1
Below grade plane	1	100	3	1
	2	75	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), excluding all increases allowed in the footnotes to those tables.

b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.

c. Vertical fire barriers separating control areas from other spaces on the same floor are permitted to be 1-hour fire-resistance rated.

d. See Section 414.2.4 of the International Building Code for additional requirements.

e. The percentage of the maximum allowable quantity per control area shown in Table 3805.4 shall be applied to 25 percent of Table 5003.1.1(1) limits for Class 4 *oxidizers* or pyrophoric materials.

CHAPTER 39 PROCESSING AND EXTRACTION FACILITIES

~~[NY]~~ **3901.1 Scope.** Facilities where ~~Plant~~ plant processing and solvent based extraction are conducted, including but not limited to cultivation and related activities; pre-*extraction* *or* *post*-*extraction* ~~*facilities* utilizing a process that includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery~~ *shall comply with this chapter and the* Building Code of New York State. ~~The extraction process includes the act of extraction of the oils and fats by use of a~~

~~solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery.~~ The use, storage, transfilling and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the *Building Code of New York State*.

> **Exception:** Greenhouses in compliance with Section 3112 of the *International Building Code* not utilizing carbon dioxide enrichment.

3901.2 Existing buildings or facilities. Existing buildings or facilities used for the processing or extraction of plant oils using solvents shall comply with this chapter. Existing extraction processes where the medium of extraction is changed to include the use of ~~a~~ solvents shall comply with this chapter.

3901.4 Lighting. Where used, horticultural lights or lighting systems shall be *listed* and *labeled* in accordance with UL 8800 and installed in accordance with the listing, the manufacturer's installation instructions, and NFPA 70.

3901.5 Carbon Dioxide Generation. Carbon dioxide enriched atmospheres generated using methods to create carbon dioxide as a by-product shall meet the requirements of Section 5307.4.1 through 5307.4.7.

3903.7 Means of Egress. *Exit* and *exit access* doors from rooms or areas used for extraction shall swing in the direction of egress travel.

3904.1 General requirements. Systems and equipment used with the processing ~~and~~ or extraction of oils and products from plants shall comply with Sections 3904.2 through 3904.2.2.3 and Section 5003.2, and other applicable provisions of this code, the *Building Code of New York State* and the *Mechanical Code of New York State*.

3904.2 Systems and equipment. Systems or equipment used for the extraction or processing of oils from plant material shall comply with Section 3904.2.1 or 3904.2.2~~. be listed or approved for the specific use. If the system used for extraction of oils and products from plant material is not listed, the system shall be reviewed by a registered design professional. The registered design professional shall review and consider any information provided by the system's designer or manufacturer. For systems and equipment not listed for the specific use, a technical report in accordance with Section 3904.3 shall be prepared and submitted to the fire code official for review and approval. The firm or individual preparing the technical report shall be approved by the fire code official prior to performing the analysis.~~

3904.2.1 Listings. Systems or equipment used for the extraction of oils from plant material shall be *listed* and *labeled* in accordance with UL 1389 and installed in accordance with the listing and the manufacturer's installation instructions.

3904.2.2 Approvals. Systems or equipment used for the extraction of oils from plant material shall be *approved* for the specific use. The system shall be reviewed by a *registered design professional*. The *registered design professional* shall review and consider any information provided by the system's designer or manufacturer. A technical report in accordance with Section 3904.2.2.1 shall be prepared and submitted to the *fire code official* for review and approval. The firm or individual preparing the technical report shall be *approved* by the *fire code official* prior to performing the analysis.

~~**[NY]3904.3**~~ **3904.2.2.1 Technical report.** A technical report, reviewed and approved by the fire code official ~~if~~ as required by Section 3904.2, is required prior to the equipment being located or installed at the facility. The report shall be prepared by a registered design professional or other professional approved by the fire code official.

~~**3904.3.1**~~ **3904.2.2.2 Report content. (Note: The body of this section is unchanged and was omitted)**

~~**[NY] 3904.4**~~ **3904.2.2.3 Site inspection.** Prior to operation of the extraction equipment, where required by the fire code official, the engineer of record or approved professional, as approved in Section 3904.2, shall inspect the site of the extraction process once equipment has been installed for compliance with the technical report and the building analysis. The engineer of record or approved professional shall provide a report of findings and observations of the site inspection to the fire code official prior to the approval of the extraction process. The field inspection report authored by the engineer of record shall include the serial number of the equipment used in the process and ~~If a field inspection report is required by Section 3904.2, the engineer of record or approved professional~~ shall confirm that the equipment installed is the same model and type of equipment identified in the technical report.

3905.1 Gas detection. For extraction processes utilizing flammable gases as solvents, a gas detection system complying with Section 916 shall be provided. ~~The gas detection threshold shall be not greater than 25 percent of the lower explosive limit/lower flammability limit (LEL/LFL) of the materials.~~

~~**3905.1.1 System design.** The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the LFL.~~

~~**3905.1.3**~~ **3905.1.1 Operation.** Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visual alarm signals in the extraction room.
2. Deactivation of all heating systems located in the extraction room.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.
4. De-energize all light switches and electrical outlets.

~~**3905.1.2 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with 2075—2013 for use with the gases and vapors being detected.~~

~~**3905.1.4**~~ **3905.1.2 Failure of the gas detection system.** Failure of the gas detection system shall result in the deactivation of the heating system; activation of the mechanical ventilation system where the system is interlocked with the gas detection system; and initiation of a trouble signal to sound in an approved location.

~~**3905.1.5 Interlocks.** Electrical components within the extraction room shall be interlocked with the gas detection system. Activation of the gas detection system shall disable all light switches and electrical outlets.~~

3905.3 Ventilation. Continuous mechanical exhaust ventilation shall be provided in accordance with Section 3905.3.1 through 3905.3.4 and Chapter 4 of the *International Mechanical Code*.

3905.3.1 Extraction processes using flammable or combustible liquids or gases. Continuous mechanical exhaust ventilation shall be provided where extraction processes use flammable or *combustible liquids* or gases. The mechanical exhaust ventilation shall provide a minimum airflow rate of not less than 5 cfm/ft^2 [0.0254 m^3/(s*m^2)] of floor area to prevent an accumulation of flammable vapors from exceeding 25 percent of the lower explosive limit (LEL).

Exception: Where the registered design professional demonstrates that an engineered mechanical exhaust ventilation system design will prevent the maximum concentration of contaminants from exceeding 25 percent of the LEL, the minimum required rate of exhaust shall be reduced in accordance with such engineered system design.

3905.3.2 Extraction processes using compressed asphyxiant or inert gases. Continuous mechanical exhaust ventilation shall be provided where extraction processes use compressed asphyxiant or inert gases. Mechanical exhaust ventilation shall be provided in accordance with Section 5307.2.

3905.3.3 Post-extraction processes using flammable or combustible liquids or gases. Where flammable liquids, *combustible liquids* heated above their flashpoint, or flammable gases are used in post-extraction processing the room or area shall be provided with continuous mechanical exhaust in accordance with Section 5004.3.

3905.3.4 Interlocks. Interlocks shall be provided where electrical equipment and appliances are used in processes that generate flammable vapors or gases. Such equipment and appliances shall be interlocked with ventilation fans so that the equipment and appliances cannot be operated unless the exhaust ventilation fans are in operation.

CHAPTER 40 STORAGE OF DISTILLED SPIRITS AND WINES

4001 GENERAL

4001.1 General. The storage of distilled spirits and wines in barrels and casks shall comply with this chapter in addition to other applicable requirements of this code.

4001.1.1 Nonapplicability. Chapter 50 and Chapter 57 of this code are not applicable to the storage of distilled spirits and wines in barrels and casks as identified in Section 5001.1, Exception 10, and Section 5701.2, Item 10.

SECTION 4002 DEFINITIONS

4002.1 Terms defined in Chapter 2. Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

SECTION 4003 PRECAUTIONS AGAINST FIRE

4003.1 Spill Control. Drainage or containment systems shall be provided by means of curbs, scuppers, special drains, or other suitable means to prevent the flow of spills throughout the building.

4003.2 Ventilation. For rooms and spaces where distilled spirits and wines in barrels and casks are stored, ventilation shall be provided in accordance with the International Mechanical Code and one of the following:

1. The rooms and spaces shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25 percemt of the *lower flammable limit* (LFL). This shall be confirmed by sampling of the actual vapor concentration under normal operating conditions. The sampling shall be conducted throughout the enclosed storage area extending to or toward the bottom and the top of the enclosed storage area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure. The sampling shall be conducted manually or by installation of a continuously monitoring flammable vapor detection system.

2. The rooms and spaces shall be provided exhaust ventilation at a rate of not less than 1 cfm per square foot [0.00508 $m^3/(s\ xm^2)$] of solid floor area. The exhaust ventilation shall be accomplished by natural or mechanical means, with discharge of the exhaust to a safe location outside the building.

4003.3 Sources of ignition. Sources of ignition shall be controlled in accordance with Sections 4003.3.1 through 4003.4.

4003.3.1 Smoking. Smoking shall be prohibited and "No Smoking" signs provided as follows:

1. In rooms or areas where hazardous materials are stored or dispensed or used in open systems in amounts requiring a permit in accordance with Sections 105.5 and 105.6.

2. Within 25 feet (7620 mm) of outdoor storage, dispensing or open use areas.

3. Facility or areas within facilities that have been designated as totally "no smoking" shall have "No Smoking" signs placed at all entrances to the facility or area. Designated areas within such facilities where smoking is permitted either permanently or temporarily shall be identified with signs designating that smoking is permitted in these areas only.

4. In rooms or areas where flammable or combustible hazardous materials are stored, dispensed or used.

Signs required by this section shall be in English as a primary language or in symbols allowed by this code and shall comply with Section 310.

4003.3.2 Open Flame. Open flames and high-temperature devices shall not be used in a manner that creates a hazardous condition and shall be *listed* for use with the hazardous materials stored or used.

4003.3.3 Industrial trucks. Powered industrial trucks used in areas designated as hazardous (classified)locations in accordance with NFPA 70 shall be *listed* and *labeled* for use in the environment intended in accordance with NFPA 505.

4003.3.4 Electrical. Electrical wiring and equipment shall be installed and maintained in accordance with Section 603 and NFPA 70.

4003.4 Lightning. Structures containing barrel storage should be protected from lightning. The lightning protection equipment shall be installed in accordance with NFPA 780 and NFPA 70.

SECTION 4004 STORAGE

4004.1 Storage. Storage shall be in accordance with this section and Section 315.

4004.2 Empty containers. The storage of empty containers previously used for the storage of *flammable* or *combustible liquids*, unless free from explosive vapors, shall be stored as required for filled containers.

4004.3 Basement storage. Class I liquids shall be allowed to be stored in *basements* in amounts not exceeding the *maximum allowable quantity per control area* for use-open systems in Table 5003.1.1(1), provided that automatic suppression and other fire protection are provided in accordance with Chapter 9. Class II and IIIA liquids shall also be allowed to be stored in *basements*, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

4004.4 Bulk beverage storage areas. There shall be no storage of combustible materials in the bulk beverage storage areas not related to the beverage storage activities.

SECTION 4005 FIRE PROTECTION

4005.1 Palletized storage of distilled spirits in wooden barrels. The palletized storage of distilled spirits in wooden barrels shall be protected by an *approved automatic sprinkler system* installed throughout the building in accordance with Section 903.3.1.1 as modified in this section. The palletized storage of metal containers of distilled spirits shall be protected by an *approved automatic sprinkler system* that complies with Chapter 57.

4005.1.1 Storage height. Palletized storage arrays of barrels stored on-end shall be limited to a maximum of seven pallets high.

4005.1.2 Flue spaces. Flue spaces with a minimum width of 6 inches (152 mm) shall be maintained between adjacent pallets.

4005.1.3 Loading aisles. Palletized storage that is provided with a defined loading aisle between pallet storage areas shall be arranged using one of the following:

1. Draft curtains, installed in accordance with Section 4005.1.3.1, shall be provided along the side of palletized storage facing the loading aisle to separate the quick response sprinklers and standard response sprinklers.
2. A trench drain shall be provided on each side of the loading aisle, arranged to capture any spilled distilled spirits in the aisle space and remove them from the building to prevent spills from spreading into the barrel storage area.
3. Barrels shall be banded on each pallet to prevent barrels from falling off pallets during transportation and loading into the storage racks.

4005.1.3.1 Draft curtains. Where installed in accordance with Section 4005.1.3, Item 1, draft curtains shall be designed and constructed in accordance with Sections 4005.1.3.1.1 through 4005.1.3.1.3.

4005.1.3.1.1 Construction. Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other *approved* noncombustible materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be designed to resist the passage of smoke.

4005.1.3.1.2 Location. Draft curtains shall be located along loading aisles serving storage areas.

4005.1.3.1.3 Depth. Draft curtains shall extend vertically downward from the ceiling for a minimum distance of 20 percent of the ceiling height measured from the floor, with a minimum depth of 6 feet (1829 mm).

4005.1.4 Automatic sprinkler system design. Storage heights and automatic sprinkler densities for palletized on-end barrels shall in accordance with Table 4005.1.4 and Sections 4005.1.4.1 through 4005.1.4.6.

TABLE 4005.1.4 Palletized Storage of Distilled Spirits with up to 75% Alcohol by Volume in Wooden Barrels

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Ceiling Sprinkler Protection		
				Response / Nominal Temperature Rating / Orientation	K-factor gpm/psi$^{1/2}$	Design [a], # of Sprinklers @ Pressure (psi)

Barrel Storage	Wet-pipe	30	24 feet or 7 barrels	QR / 165ºF / Pendent	14.0	12 @ 18
	Dry-pipe			SR / 286ºF / Upright	16.8	24 @ 13
	Wet-pipe	30	1 barrel	Any / 165ºF / Any	11.2	30 @ 7
	Dry-pipe			SR / 286ºF / Upright	11.2	50 @ 7
	Wet-pipe	30	2 barrels	SR / 286ºF / Any	11.2	50 @ 29
Loading Aisle w/ Draft Curtain	Wet-pipe or Dry-pipe	30	NA	SR / 286ºF / Any	5.6	100 @ 13
					> 8.0	100 @ 7
Loading aisle w/ trench drains or banded barrels or no permanent loading aisle	Provide the barrel storage design across the entire roof area (i.e., storage area and loading aisle)					

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi$^{1/2}$ = 14.395 L/min/bar$^{1/2}$; °C = [(°F)-32]/1.8.

QR = quick response; SR = standard response; NA = not applicable

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

4005.1.4.1 Protected product. The storage and automatic sprinkler requirements in Table 4005.1.4 apply to alcohol-water mixtures greater than 20 percent and up to 75 percent alcohol by volume in wooden barrel sizes not exceeding 130 gallons (492 L).

4005.1.4.2 Hose stream allowance. The automatic sprinkler design shall include a 500 gallons per minute (1900 L/min) hose stream allowance.

4005.1.4.3 Water supply duration. The *automatic sprinkler system* water supply duration, including hose stream demand, shall be a minimum of 1 hour.

4005.1.4.4 Automatic sprinkler system balancing. Where a permanent loading aisle is provided with a separate *automatic sprinkler system* on the ceiling, the barrel storage automatic sprinkler design and the loading aisle automatic sprinkler design are not required to be balanced at the point of connection.

4005.1.4.5 Dry pipe sprinkler systems. Where dry-pipe sprinkler systems are installed, the sprinkler system shall be designed to deliver water to the most remote four sprinklers within 40 seconds.

4005.1.4.6 Small distilled spirits facilities. Fire protection for palletized storage of distilled spirits in small distilled spirits facilities not greater than 7,500 square feet (697 m²) is permitted to be in accordance with Sections 4005.1.4.6.1 through 4005.1.4.6.3.

4005.1.4.6.1 Ceiling clearance. The clearance from the top of storage to the deflector of the automatic sprinklers at the ceiling shall be a minimum of 18 inches (457 mm) and a maximum of 10 feet (3048 mm).

4005.1.4.6.2 Automatic sprinkler coverage area. The automatic sprinkler coverage area shall not exceed 80 square feet (7.4 m2) per sprinkler.

4005.1.4.6.3 Fire protection scheme. The storage arrangement *and automatic sprinkler system* design shall be in accordance with Table 4005.1.4.6.3.

TABLE 4005.1.4.6.3 PALLETIZED STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS IN SMALL DISTILLED SPIRITS FACILITIES

				Ceiling Sprinkler Protection

Protection Area	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height (feet)	Response / Temperature Rating / Orientation	K-factor ($gpm/psi^{1/2}$)	Sprinkler Density (gpm/ft^2)	Area (square feet)
Barrel Storage	Wet-pipe	24	12	SR / 286°F / Any	≥ 11.2	0.35	4000
				SR / 165°F / Any	≥ 11.2	0.35	7500

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 $gpm/psi^{0.5}$ = 14.395 $L/min/bar^{0.5}$; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 $L/min/m^2$.

Notes: SR = standard response sprinkler.

4005.2 Rack storage in wooden barrels. The rack storage of distilled spirits and wine greater than 20 percent alcohol shall be protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1 and Sections 4005.2.1 through 4005.2.3.6.

4005.2.1 Flues spaces for on-side wooden barrels. Rack storage for on-side wooden barrels shall be provided with a minimum width of 8 inches (203 mm) between adjacent rows of barrels.

4005.2.1.1 Elevated walkways. Where provided, elevated walkways between barrels shall be constructed in accordance with one of the following:

1. Noncombustible materials that are 50 percent open.
2. Noncombustible materials that are open less than 50 percent provided the walkway has a maximum width of 1 foot (305 mm) and a minimum gap of 3 inches (76 mm) is provided between the walkway and the barrel storage.
3. Combustible materials and provided with a row of automatic sprinklers directly beneath each walkway.

4005.2.2 Flues spaces for on-end wooden barrels. Rack storage arrangements with on-end wooden barrels shall be provided with transverse and longitudinal flue spaces with a minimum width of 6 inches (152 mm).

4005.2.3 Fire protection for rack storage. Rack storage arrangements of alcohol-water mixtures up to 75 percent alcohol in wooden barrel with sizes not exceeding 130 gallons (492 L) shall be protected in accordance with Sections 4005.2.3.1 through 4005.2.3.6.

4005.2.3.1 Hose stream allowance. The *automatic sprinkler system* design shall include a 500-gallon-per-minute (1900 L/min) hose stream allowance.

4005.2.3.2 Water supply duration. The automatic sprinkler system water supply duration, including hose stream demand, shall be a minimum of 1 hour.

4005.2.3.3 Dry-pipe automatic sprinkler system. Where dry-pipe *automatic sprinkler systems* are installed, the *automatic sprinkler system* shall be designed to deliver water to the most remote four sprinklers within 40 seconds.

4005.2.3.4 Ceiling automatic sprinkler systems. The *automatic sprinkler systems* installed at the ceiling shall be designed with a minimum density of 0.2 gallon per minute (0.8 L/min) per square foot with an operating area of 2,000 square feet (186 m^2).

4005.2.3.5 Automatic sprinkler system balancing. The *automatic sprinkler system* installed at the ceiling and the in-rack sprinkler system shall be balanced at the point of connection.

4005.2.3.6 Automatic sprinkler system design. The design of the *automatic sprinkler system* at the ceiling and the in-rack sprinkler system shall be in accordance with Table 4005.2.3.6.

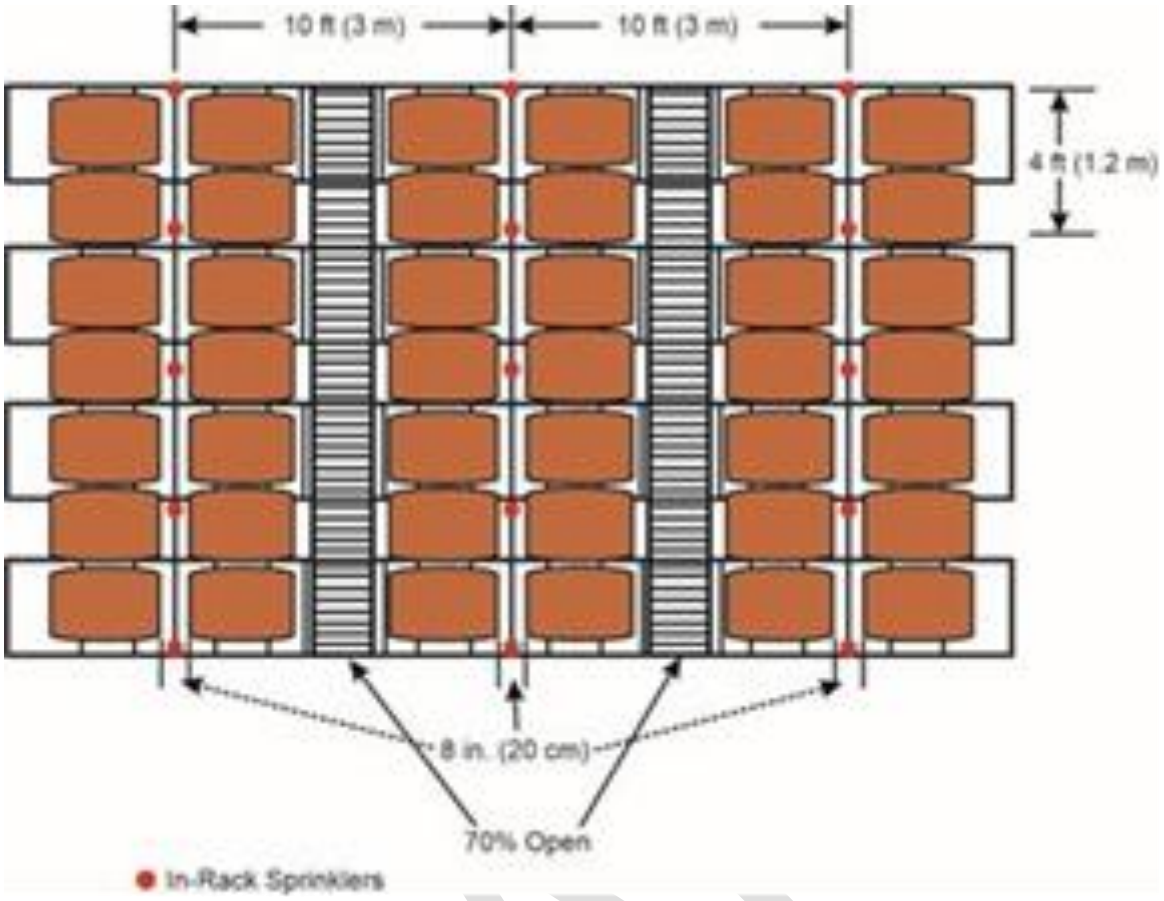


FIGURE 4005.2.3.6(1) IN-RACK SPRINKLER LAYOUT FOR WOODEN BARRELS ON THEIR SIDES (PLAN VIEW)

Figure credit: FM Global Property Loss Prevention Data Sheet 7-29

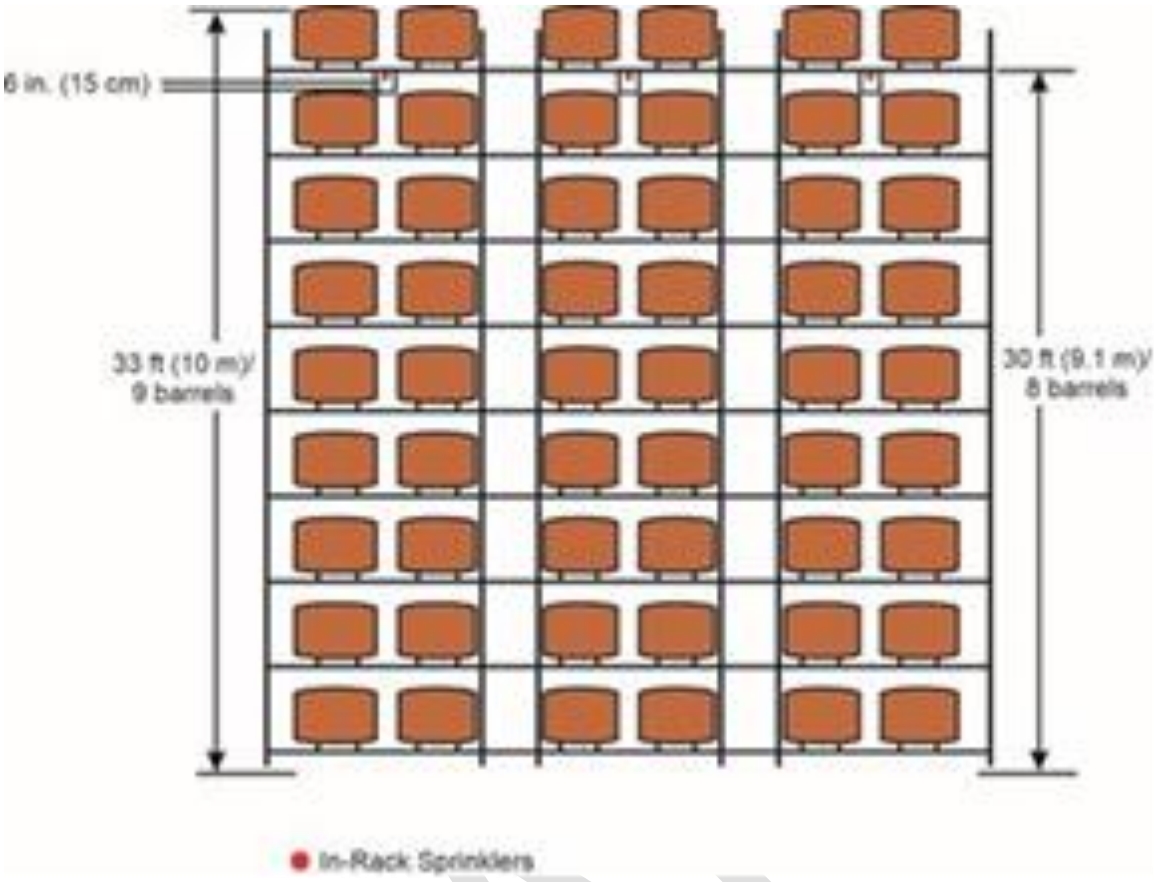


FIGURE 4005.2.3.6(2) IN-RACK SPRINKLER LAYOUT FOR WOODEN BARRELS ON THEIR SIDES (ELEVATION VIEW)

Figure credit: FM Global Property Loss Prevention Data Sheet 7-29

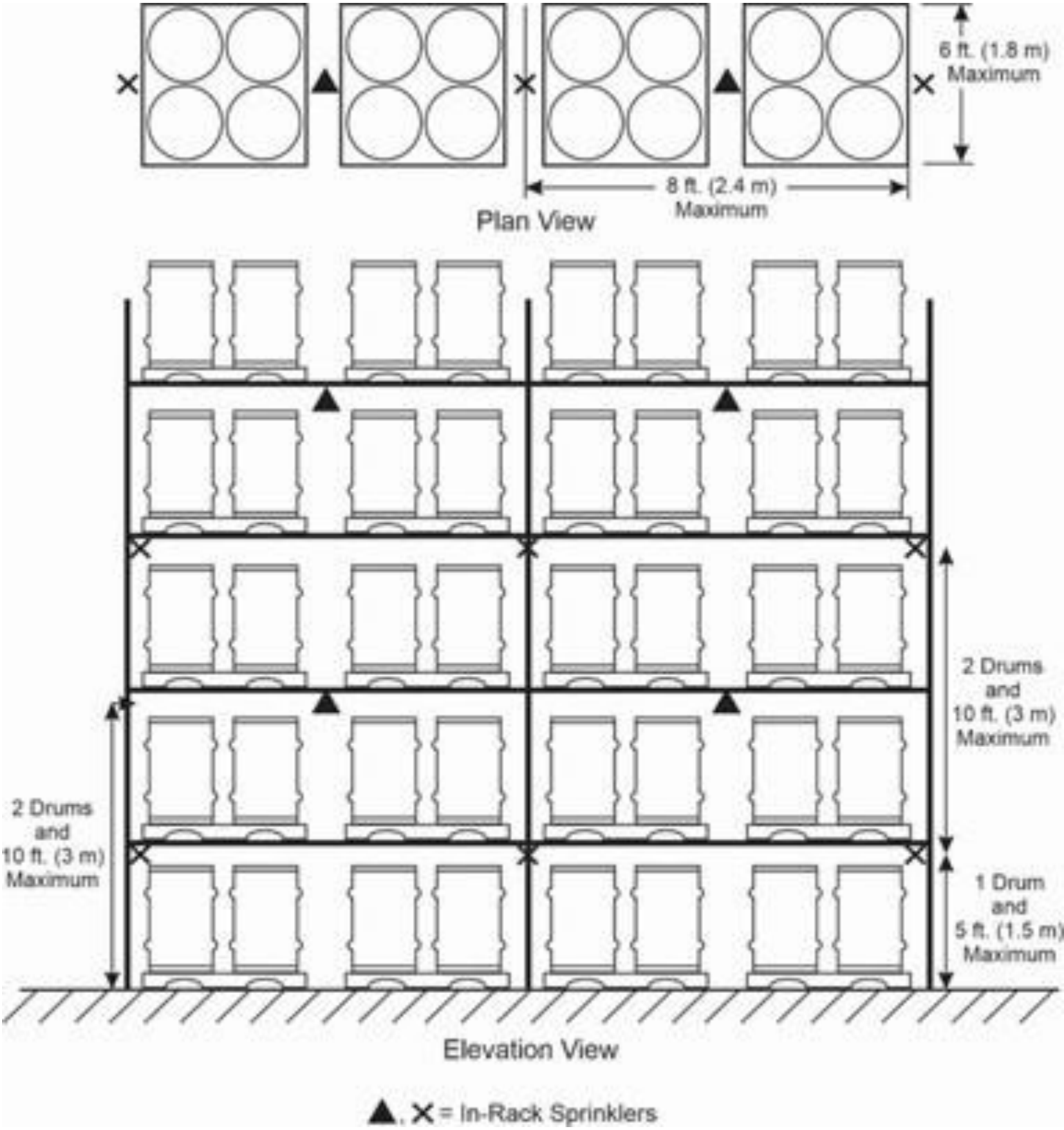


FIGURE 4005.2.3.6(3) IN-RACK SPRINKLER LAYOUT FOR SINGLE ROW RACK OF ON-END WOODEN BARRELS

Figure credit: FM Global Property Loss Prevention Data Sheet 7-29

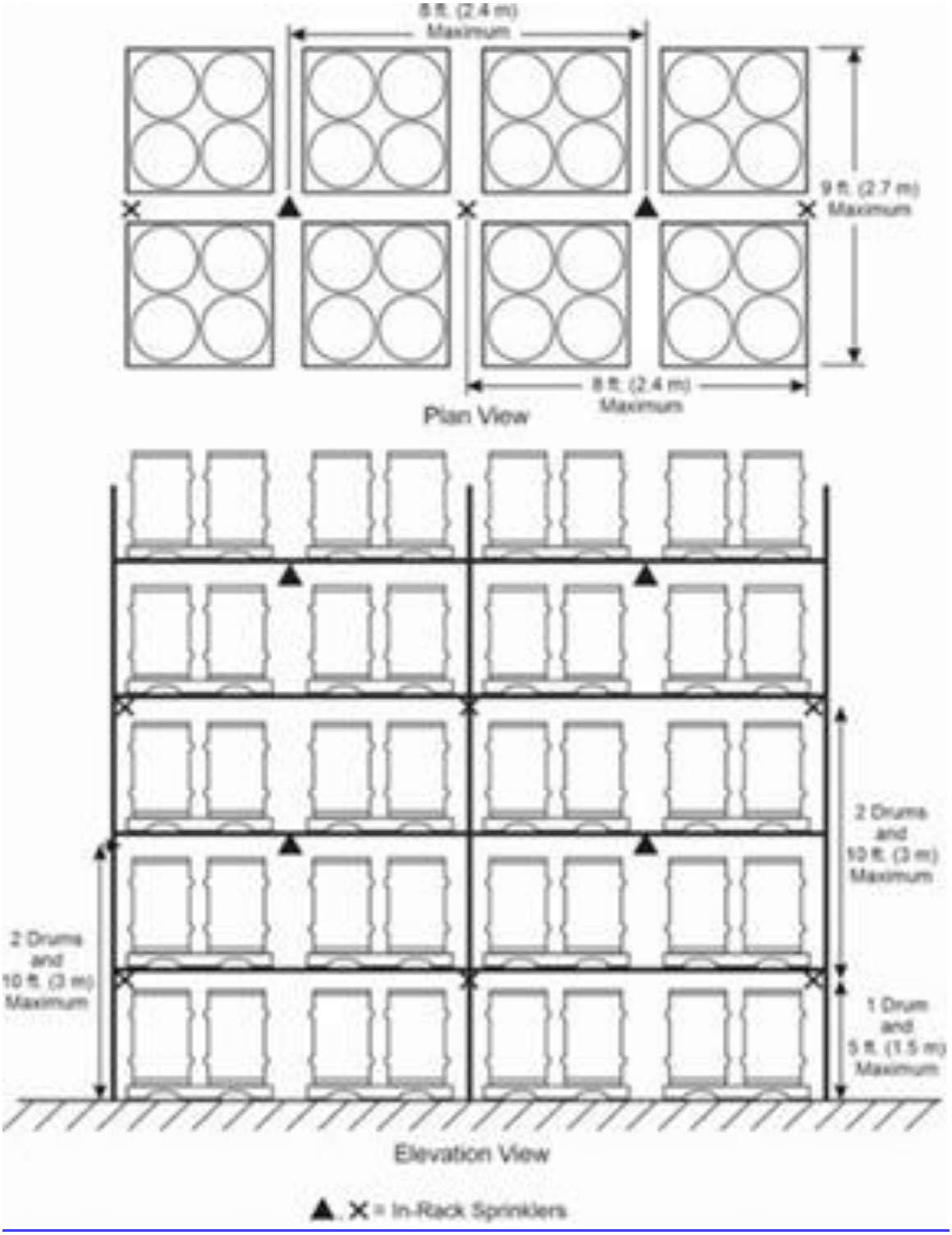


FIGURE 4005.2.3.6(4) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

Figure credit: FM Global Property Loss Prevention Data Sheet 7-29

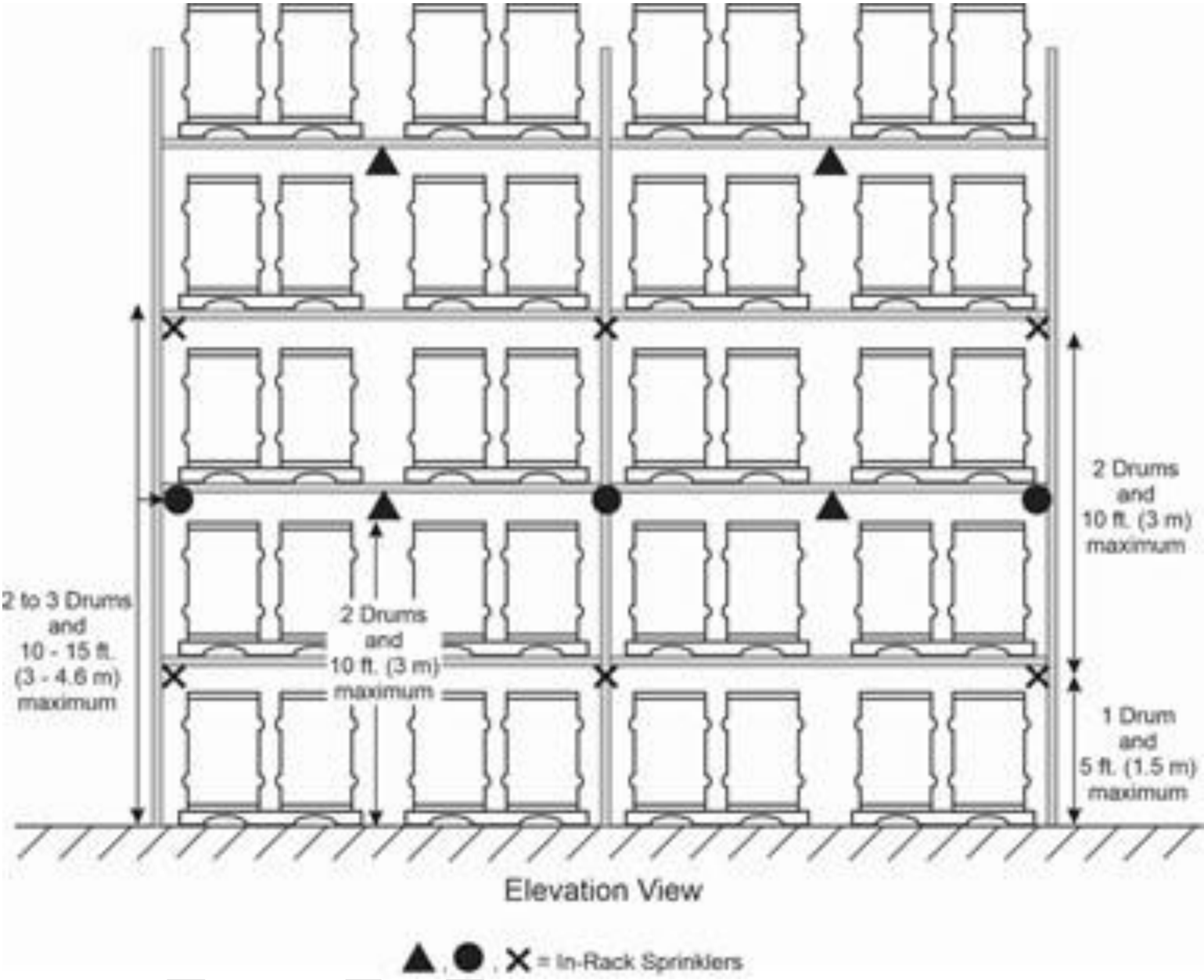


FIGURE 4005.2.3.6(5) IN-RACK SPRINKLER LAYOUT FOR DOUBLE ROW RACK OF ON-END WOODEN BARRELS

Figure credit: FM Global Property Loss Prevention Data Sheet 7-29

TABLE 4005.2.3.6 RACK STORAGE OF DISTILLED SPIRITS IN WOODEN BARRELS

Barrel Arrangement	Sprinkler System Type	Maximum Ceiling Height (feet)	Maximum Storage Height	Minimum Aisle Width (feet)	Ceiling Sprinkler Protection			In-Rack Sprinkler Protection			
					Response / Nominal Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Design, # of Sprinklers @ Pressure (psi)	Layout	Response / Nominal Temperature Rating / Orientation	K-factor (gpm/psi$^{1/2}$)	Design [a], # of Sprinklers @ Pressure (psi)
On-Side	Wet	40	33 feet / 9 barrels	NA	QR / 165°F / Pendent	14.0	12 @ 37	None			

					SR / 286ºF / Any	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165ºF / Any	8.0	6 @ 45 [one level of in racks]or 12 @ 45 [more thanone level of in-racks]
	Dry	40	33 feet / 9 barrels	NA	SR / 286ºF / Upright	16.8	24 @ 25	None			
					SR / 286ºF / Upright	≥ 11.2	20 @ 7	Figures 4005.2.3.6(1) and 4005.2.3.6(2)	QR / 165ºF / Upright	8.0	6 @ 45 [one level of in racks]or 12 @ 45 [more than one level of in-racks]
On-End	Wet	30	25 feet / 5 barrels	8	SR / 286ºF / Any	≥ 11.2	50 @ 7	Figures 4005.2.3.6(3), 4005.2.3.6(4), and 4005.2.3.6(6)	QR / 165ºF / Any	≥ 8.0	6 @ 25[one level]or 12 @ 25 [more than one level]

For SI: 1 foot = 304.8 mm; 1 pound per square inch (psi) = 6.895 kPa; K-Factor of 1 gpm/psi$^{0.5}$ = 14.395 L/min/bar$^{0.5}$; °C = [(°F)-32]/1.8; 1 gallon per minute per square foot = 40.75 L/min/m².

QR – quick response; SR – standard response; NA – not applicable

a. Sprinklers shall have a maximum coverage area of 100 square feet (9.3 m²).

4005.3 Wine with 20 percent or less alcohol content. The storage of wine in barrels with an alcohol content of 20 percent or less shall be protected by an *approved automatic sprinkler system* installed throughout in accordance with Section 903.3.1.1.

4005.4 Portable Fire Extinguishers. *Approved* portable fire extinguishers shall be provided in accordance with Section 906.

SECTION 4006 SIGNAGE

4006.1 Hazard identification signs. Unless otherwise exempted by the *fire code official*, visible hazard identification signs, as specified in NFPA 704 for the specific material contained, shall be placed on stationary containers and above-ground tanks; at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit; and at specific entrances and locations designated by the *fire code official*.

4006.1.1 Maintenance and style. Signs and markings required by Section 4006.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color, and lettering shall be *approved*.

CHAPTER 41 TEMPORARY HEATING AND COOKING OPERATIONS

4101.1 General. The provisions of this chapter shall apply to the use, operation, testing and maintenance of mobile and portable equipment and devices used for temporary heating and cooking. Temporary heating and cooking operations with open flames shall also comply with any additional applicable requirements in Section 308.

> **Exception:** Temporary heating devices used in the course of construction, alteration and demolition of structures shall comply with Section 3304.

4101.2 Permits. Operational permits shall be obtained as set forth in Section 105.5.

4101.3 Listed Equipment. Mobile and portable equipment and devices used for temporary heating and cooking shall be *listed* and *labeled*. The installation, maintenance and use of equipment and devices shall be in accordance with their listing and the manufacturer's instructions.

4101.4 Operation and Maintenance. The building owner or the equipment owner/operator shall operate and maintain the equipment in accordance with the manufacturer's operating instructions and this section.

4101.4.1 Wildfire Risk Area. Temporary heating and cooking operations shall be in accordance with applicable local wildfire risk area regulations.

4101.4.2 Attendance. Mobile and portable heating and cooking equipment shall be constantly attended while in use and until cooled to a safe temperature.

4101.4.3 Fire extinguishers. Not fewer than one portable fire extinguisher complying with Section 906 with a minimum 4-A rating or other *approved* on-site fire-extinguishing equipment shall be available for immediate utilization.

~~3107.12.7~~ **4101.5 Electrical heating and cooking equipment.** Electrical cooking and heating equipment shall comply with NFPA 70 and this chapter.

~~3107.13~~ **4101.6 LP-gas.** The storage, handling and use of LP-gas and LP-gas equipment shall be in accordance with Sections ~~3107.13.1 through 3107.13.3.~~ 4101.6.1 through 4101.6.3.

~~3107.13.1~~ **4101.6.1 General.** LP-gas equipment such as containers, tanks, piping, hoses, fittings, valves, tubing and other related components shall be approved and in accordance with Chapter 61 and with the *International Fuel Gas Code*.

~~3107.13.2~~ **4101.6.2 Location of containers.** LP-gas containers and tanks shall be located outside in accordance with Table 6104.3. Pressure relief devices shall be pointed away from the ~~*tent or membrane* structure~~ any building or structure and shall be in accordance with Chapter 61.

~~3107.13.3~~ **4101.6.3 Protection and security.** Portable LP-gas containers, tanks, piping, valves and fittings that are located outside and are being used to fuel equipment inside a *tent* or *membrane structure* shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an *approved* location. Portable LP-gas containers shall be secured to prevent unauthorized movement.

4101.6.4 Refueling. Exchanging of LP containers shall be conducted in accordance with Chapter 61. Liquid transfer of LP gas shall be in accordance with Chapter 7 of NFPA 58.

4101.7 Oil-fired Heaters. Oil-fired cooking and heating equipment shall comply with Section 605 and this chapter.

4101.8 Refueling of flammable and combustible liquid fueled equipment. Refueling operations for liquid fueled equipment or devices shall be conducted in accordance with section 5705 and all of the following:

1 Refueling operations for liquid fueled equipment or devices shall be conducted by trained personnel in accordance with the manufacturer's instructions and this code.

2 The equipment or device shall be turned off and allowed to cool prior to refueling.

3 Operations shall be conducted in a well-ventilated area, at a minimum of 10 feet (3048 mm) from any building or structure.

4101.9 Cooking Operations. Portable cooking equipment using combustible oils or solids shall comply with all of the following:

1. A noncombustible lid shall be immediately available. The lid shall be of sufficient size to cover the cooking well completely.

2 Equipment shall be placed on a non-combustible surface.

3 A portable fire extinguisher for protection appropriate to the cooking media shall be provided at a location *approved* by the *fire code official*.

4101.10 Hazard abatement. Operations or conditions deemed unsafe or hazardous by the *fire code official* shall be abated. Equipment and devices that are modified or damaged and constitute an electrical shock or fire hazard shall not be used.

4101.10.1 Correction of Unsafe Conditions. The *fire code official* shall be authorized to require the *owner*, the owner's authorized agent, operator or user of the equipment to abate unsafe operations or conditions or cause such conditions to be abated or corrected either by removal, repair, rehabilitation, disposal or other *approved* corrective action in compliance with this code.

SECTION 4102 PORTABLE ELECTRICAL HEATING APPLIANCES.

~~604.10~~ 4102.1 **Portable, electric space heaters.** Where not prohibited by other sections of this code, portable, electric space heaters shall be permitted to be used in all occupancies in accordance with Sections ~~604.10.1~~ 4102.1.1 through ~~604.10.5~~ 4102.1.5.

~~604.10.1~~ 4102.1.1 **Listed and labeled.** Only *listed* and *labeled* portable, electric space heaters shall be used.

~~604.10.2~~ 4102.1.2 **Power supply.** Portable, electric space heaters shall be plugged directly into an *approved* receptacle.

~~604.10.3~~ 4102.1.3 **Extension cords.** Portable, electric space heaters shall not be plugged into extension cords.

~~604.10.4~~ 4102.1.4 **Prohibited areas.** Portable, electric space heaters shall not be operated within 3 feet (914 mm) of any combustible materials. Portable, electric space heaters shall be operated only in locations for which they are *listed*.

~~604.10.5~~ 4102.1.5 **Group I-2 occupancies and ambulatory care facilities.** Where used in Group I-2 and ambulatory care facilities, portable, electric space heaters shall be limited to those having a heating element that cannot exceed a temperature of 212°F (100°C), and such heaters shall only be used in nonsleeping staff and employee areas.

SECTION 4103 PORTABLE FUEL-FIRED HEATING APPLIANCES.

[NY]~~603.4~~ 4103.1 **Portable unvented heaters.** Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4 and ambulatory care facilities. The use of unvented portable kerosene fired heaters is further regulated by New York State Real Property Law Article 7A.

Exceptions:

1. ~~In one- and two-family dwellings~~ Portable unvented fuel-fired heaters~~, where approved and~~ *listed* and *labeled* in accordance with UL 647 are permitted to be used in one- and two-family *dwellings*, where operated and maintained in accordance with the manufacturer's instructions.
2. Portable outdoor gas-fired heating appliances in accordance with Section ~~603.4.2~~ 4103.1.2.

~~603.4.1~~ 4103.1.1 **Prohibited locations.** Unvented fuel-fired heating equipment shall not be located in, or obtain combustion air from, any of the following rooms or spaces: sleeping rooms, bathrooms, toilet rooms or storage closets.

~~603.4.2~~ 4103.1.2 **Portable outdoor gas-fired heating appliances.** Portable gas-fired heating appliances located outdoors shall be in accordance with Sections ~~603.4.2.1 through 603.4.2.3.4.~~ 4103.1.2.1 through 4103.1.2.3.4

~~603.4.2.1~~ 4103.1.2.1 **Location.** Portable outdoor gas-fired heating appliances shall be used and located in accordance with Sections~~605.5.2.1.1 through 605.5.2.1.4~~. 4103.1.2.2.1 through 4103.1.2.1.4

~~603.4.2.1.1~~ 4103.1.2.1.1 **Prohibited locations.** The storage or use of portable outdoor gas-fired heating appliances is prohibited in any of the following locations, except where permitted by Chapter 61, or where the appliance is used in accordance with it's listing:

1. Inside of any occupancy where connected to the fuel gas container.
2. Inside of tents, canopies and membrane structures.
3. On exterior balconies.

~~Exception:~~ ~~As allowed in Section 6.22 of NFPA 58.~~

~~603.4.2.1.2~~ 4103.1.2.1.2 **Clearance to buildings.** Portable outdoor gas-fired heating appliances shall be located not less than 5 feet (1524 mm) from buildings.

~~603.4.2.1.3~~ 4103.1.2.1.3 **Clearance to combustible materials.** Portable outdoor gas-fired heating appliances shall not be located beneath, or closer than 5 feet (1524 mm) to combustible decorations and combustible overhangs, awnings,

sunshades or similar combustible attachments to buildings. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 (3048 mm) feet of combustible materials.

~~603.4.2.1.4~~ 4103.1.2.1.4 **Proximity to exits.** Portable outdoor gas-fired heating appliances shall not be located within 5 feet (1524 mm) of exits or exit discharges. Portable gas-fired heating appliances used within tents, canopies, or membrane structures shall not be located within 10 feet (3048 mm) of exits or exit discharges.

~~603.4.2.2~~ 4103.1.2.2 Use ~~Installation~~ **and operation.** Portable outdoor gas-fired heating appliances shall be used and operated in accordance with Sections ~~603.4.2.2.1~~ 4103.1.2.2.1 through ~~603.4.2.2.4.~~ 4103.1.2.2.4

~~603.4.2.2.1~~ 4103.1.2.2.1 **Listing and approval.** Only *listed* and *approved* portable outdoor gas-fired heating appliances utilizing a fuel gas container that is integral to the appliance shall be used. Portable outdoor gas-fired heating appliances shall be *listed* and *labeled* in accordance with ANSI Z83.26/CSA 2.37.

~~603.4.2.2.2~~ 4103.1.2.2.2 ~~Installation~~ Use **and maintenance.** Portable outdoor gas-fired heating appliances shall be ~~installed~~ used and maintained in accordance with the manufacturer's instructions.

~~603.4.2.2.3~~ 4103.1.2.2.3 **Tip-over switch.** Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.

~~603.4.2.2.4~~ 4103.1.2.2.4 **Guard against contact.** The heating element or combustion chamber of portable outdoor gas-fired heating appliances shall be provided with a permanent integral guard permanently guarded so as to prevent accidental contact by persons or material.

~~603.4.2.3~~ 4103.1.2.3 **Gas containers.** Fuel gas containers for portable outdoor gas-fired heating appliances shall comply with Sections ~~605.5.2.3.1 through 605.5.2.3.4~~. 4103.1.2.3.1 through 4103.1.2.3.4

~~603.4.2.3.1~~ 4103.1.2.3.1 **Approved containers.** Only *approved* DOTn or ASME gas containers shall be used.

~~603.4.2.3.2~~ 4103.1.2.3.2 **Container replacement.** Replacement of fuel gas containers in portable outdoor gas-fired heating appliances shall not be conducted while the public is present.

~~603.4.2.3.3~~ 4103.1.2.3.3 **Container capacity.** The maximum individual capacity of gas containers used in connection with portable outdoor gas-fired heating appliances shall not exceed 20 pounds (9 kg).

~~603.4.2.3.4~~ 4103.1.2.3.4 **Indoor storage prohibited.** Gas containers shall not be stored inside of buildings except in accordance with Section 6109.9.

SECTION 4104 PORTABLE FUEL-FIRED COOKING APPLIANCES.

4104.1 Portable Fuel-Fired Cooking Appliances. Portable fuel-fired cooking appliances shall be permitted to be used in all occupancies in accordance with this section.

~~308.1.4~~ 4104.2 **Open-flame cooking devices.** Charcoal burners and other open-flame cooking devices shall not be operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exceptions:

1. One- and two-family *dwellings*.
2. Where buildings, balconies and decks are protected by an *automatic sprinkler system*.
3. LP-gas cooking devices having LP-gas container with a water capacity not greater than 2 $^{1}/_{2}$ pounds [nominal 1 pound (0.454 kg) LP-gas capacity].

4104.3 Indoor Cooking. Portable fuel-fired cooking appliances used indoors shall not be located within 10 feet (3048 mm) of exits or combustible materials.

~~3107.12.6~~ 4104.4 ~~Outdoor~~ **Cooking Operations.** ~~Outdoor~~ Cooking that produces sparks or grease-laden vapors shall not be performed within ~~20~~10 feet (~~6096~~ 3048 mm) of ~~a tent or membrane structure.~~ any building or structure of combustible construction, or of any potential ignition source, except where the following conditions are met:

1. Cooking devices shall be isolated from the public.

2. Cooking devices shall be maintained and used according to the manufacturer's instructions.

Exception: Designated cooking tents with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

4104.5 ~~**3107.2.5**~~ **Separation of** **cooking tents.** *Tents* with sidewalls or drops where cooking is performed shall be separated from other non-cooking *tents* or *membrane structures* by not less than ~~20~~ 10 feet (~~6096~~ 3048 mm).

Exception: Small tents limited to 100 square feet that are accessory to the cooking operations of the cooking tent and are not occupied by the public.

4104.5.1 ~~**3107.12.5.1**~~ **Groups of cooking tents.** Cooking tents shall be permitted to be placed side by side where the following conditions are met:

1. The area of the cooking tents has a maximum area of 700 square feet (65 m^2).

2. Each grouping of tents shall have a fire break clearance of at least 12 feet (3658 mm).

3. A fire access aisle separating rows of cooking tents has a minimum width of 16 feet (4877 mm) clear.

~~**3107.12.4**~~ **4104.6** **Operations.** Operations such as warming of foods, cooking demonstrations and similar operations that use solid flammables, butane or other similar devices that do not pose an ignition hazard, shall be *approved*.

SECTION 4105 PORTABLE ELECTRICAL COOKING APPLIANCES.

4105.1 Portable Electrical Cooking Appliances. Portable electric cooking appliances shall be permitted to be used in all occupancies in accordance with Sections 4105.1.1 through 4105.1.5.

4105.1.1 Listed and Labeled. Portable electric cooking appliances shall be *listed* and *labeled* and shall be used in accordance with their listing and the manufacturer's instructions.

4105.1.2 Power Supply. Portable electric cooking appliances shall be plugged directly into an *approved* receptacle or connected to a relocatable power tap rated 20 amps (2400 W).

4105.1.3 Extension Cords. Portable electric cooking appliances shall not be plugged into extension cords.

4105.1.4 Temporary Connections. Where portable electric cooking appliances are used for temporary operations, the appliance shall be disconnected from the power supply when not in use.

4105.1.5 Prohibited Areas. Portable electric cooking appliances shall not be operated within 3 feet (914 mm) of any combustible materials or in Group H occupancies. Portable electric cooking appliances shall be operated only in locations for which they are *listed*.

SECTION ~~319~~ 4106 MOBILE FOOD PREPARATION VEHICLES.

~~**319.1**~~ **4106.1** **General.** Mobile food preparation vehicles that are equipped with appliances that produce smoke or grease-laden vapors for the purpose of preparing, cooking, or serving food shall comply with NFPA 96 and this section. Indoor use of mobile food preparation vehicles is prohibited unless *approved* by the *fire code official*.

~~**319.2**~~ **4106.2** **Permit required**. Permits shall be required as set forth in Section 105.5.

~~**319.3**~~ **4106.3** **Exhaust hood.** Cooking equipment that produces grease-laden vapors shall be provided with a kitchen exhaust hood constructed in accordance with Section 60~~7~~6.

~~**319.4**~~ **4106.4** ~~**Fire protection.**~~ **Maintenance.** ~~Fire protection shall be provided in accordance with Sections 319.4.1 and 319.4.2.~~ Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 4106.4.1 through 4106.4.3.

~~**319.4.1**~~ **4106.4.1** ~~**Fire protection for cooking equipment**~~ **Exhaust System.** ~~Cooking equipment shall be protected by automatic fire-extinguishing systems in accordance with Section 904.13.~~ The exhaust system, including hood, grease-removal devices, fans, ducts, and other appurtenances, shall be inspected and cleaned in accordance with NFPA 96.

~~**319.4.2**~~ **4106.4.2** ~~**Fire extinguisher**~~ **Fire protection systems and devices.** ~~Portable fire extinguishers shall be provided in accordance with Section 906.4.~~ Fire protection systems and devices shall be maintained in accordance with Section 901.6.

4106.4.3 Fuel gas systems. Fuel gas systems shall be maintained in accordance with 4106.4.3.1 through 4106.4.3.4.

4106.4.3.1 LP-gas systems. LP-gas containers installed on the vehicle and fuel gas piping systems shall be inspected annually by an *approved* inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

4106.4.3.2 CNG systems. CNG containers and fuel gas piping systems shall be inspected annually by an *approved* inspection agency, person or special expert who is qualified to ensure that system components are free from damage, suitable for the intended service and not subject to leaking.

4106.4.3.3 Annual leakage test. All fuel gas piping systems and appliances shall be checked annually for leakage at the operating pressure of the system using a manometer or pressure gauge. Where leakage is indicated, the gas supply shall be turned off until repairs have been made and the system no longer leaks.

4106.4.3.4 Inspection tag. Upon a satisfactory annual inspection, the *approved* inspection agency, person or special expert shall affix a tag on the fuel gas system or within the vehicle indicating the name of the inspection agency and the date of the satisfactory inspection.

~~**319.5**~~ **4106.5 ~~Appliance connection to fuel supply piping~~ Manual system operation for the automatic fire extinguishing system(s).** ~~Gas cooking appliances shall be secured in place and connected to fuel supply piping with an appliance connector complying with ANSI Z21.69/CSA 6.16. The connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances shall be limited by restraining devices installed in accordance with the connector and appliance manufacturer's instructions.~~ A manual activation device shall be provided for the *automatic fire extinguishing system*(s) provided for the cooking appliance(s). The manual activation device shall be unobstructed and in view from the means of egress, located at or near a means of egress from the cooking area, and at a location acceptable to the *fire code official*. The manual actuation device shall be installed not more than 48 inches (1200 mm) nor less than 42 inches (1067 mm) above the walking surface of the means of egress 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.

~~**319.6 Cooking oil storage containers.** Cooking oil storage containers within mobile food preparation vehicles shall have a maximum aggregate volume not more than 120 gallons (454 L), and shall be stored in such a way as to not be toppled or damaged during transport.~~

~~**319.7 Cooking oil storage tanks.** Cooking oil storage tanks within mobile food preparation vehicles shall comply with Sections 319.7.1 through 319.7.5.2.~~

~~**319.7.1 Metallic storage tanks.** Metallic cooking oil storage tanks shall be listed in accordance with UL 80 or UL 142, and shall be installed in accordance with the tank manufacturer's instructions.~~

~~**319.7.2 Nonmetallic storage tanks.** Nonmetallic cooking oil storage tanks shall be installed in accordance with the tank manufacturer's instructions and shall comply with both of the following:~~

~~1. Tanks shall be listed for use with cooking oil, including maximum temperature to which the tank will be exposed during use.~~

~~2. Tank capacity shall not exceed 200 gallons (757 L) per tank.~~

~~**319.7.3 Cooking oil storage system components.** Metallic and nonmetallic cooking oil storage system components shall include, but are not limited to, piping, connections, fittings, valves, tubing, hose, pumps, vents and other related components used for the transfer of cooking oil.~~

~~**319.7.4 Design criteria.** The design, fabrication and assembly of system components shall be suitable for the working pressures, temperatures and structural stresses to be encountered by the components.~~

~~**319.7.5 Tank venting.** Normal and emergency venting shall be provided for cooking oil storage tanks.~~

~~**319.7.5.1 Normal vents.** Normal vents shall be located above the maximum normal liquid line, and shall have a minimum effective area not smaller than the largest filling or withdrawal connection. Normal vents are not required to vent to the exterior.~~

~~**319.7.5.2 Emergency vents.** Emergency relief vents shall be located above the maximum normal liquid line, and shall be in the form of a device or devices that will relieve excessive internal pressure caused by an exposure fire. For nonmetallic tanks, the emergency relief vent shall be allowed to be in the form of construction. Emergency vents are not required to discharge to the exterior.~~

~~**319.8 LP-gas systems.** Where LP-gas systems provide fuel for cooking appliances, such systems shall comply with Chapter 61 and Sections 319.8.1 through 319.8.5.~~

~~**319.8.1 Maximum aggregate volume.** The maximum aggregate capacity of LP-gas containers transported on the vehicle and used to fuel cooking appliances only shall not exceed 200 pounds (91 kg) propane capacity.~~

~~**319.8.2 Protection of container.** LP-gas containers installed on the vehicle shall be securely mounted and restrained to prevent movement.~~

~~**319.8.3 LP-gas container construction.** LP-gas containers shall be manufactured in compliance with the requirements of NFPA 58.~~

~~**319.8.4 Protection of system piping.** LP-gas system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage, and damage from vibration.~~

~~**319.8.5 LP-gas alarms.** A listed LP-gas alarm shall be installed within the vehicle in the vicinity of LP-gas system components, in accordance with the manufacturer's instructions.~~

~~**319.9 CNG systems.** Where CNG systems provide fuel for cooking appliances, such systems shall comply with Sections 319.9.1 through 319.9.4.~~

~~**319.9.1 CNG containers supplying only cooking fuel.** CNG containers installed solely to provide fuel for cooking purposes shall be in accordance with Sections 319.9.1.1 through 319.9.1.3.~~

~~**319.9.1.1 Maximum aggregate volume.** The maximum aggregate capacity of CNG containers transported on the vehicle shall not exceed 1,300 pounds (590 kg) water capacity.~~

~~**319.9.1.2 Protection of container.** CNG containers shall be securely mounted and restrained to prevent movement. Containers shall not be installed in locations subject to a direct vehicle impact.~~

~~**319.9.1.3 CNG container construction.** CNG containers shall be an NGV-2 cylinder.~~

~~**319.9.2 CNG containers supplying transportation and cooking fuel.** Where CNG containers and systems are used to supply fuel for cooking purposes in addition to being used for transportation fuel, the installation shall be in accordance with NFPA 52.~~

~~**319.9.3 Protection of system piping.** CNG system piping, including valves and fittings, shall be adequately protected to prevent tampering, impact damage and damage from vibration.~~

~~**319.9.4 Methane alarms.** A listed methane gas alarm shall be installed within the vehicle in accordance with manufacturer's instructions.~~

~~**319.10 Maintenance.** Maintenance of systems on mobile food preparation vehicles shall be in accordance with Sections 319.10.1 through 319.10.3.~~

~~**319.10.1 Exhaust system.** The exhaust system, including hood, grease removal devices, fans, ducts and other appurtenances, shall be inspected and cleaned in accordance with Section 606.3.~~

~~**319.10.2 Fire protection systems and devices.** Fire protection systems and devices shall be maintained in accordance with Section 901.6.~~

~~**319.10.3 Fuel gas systems.** LP-gas containers installed on the vehicle and fuel-gas piping systems shall be inspected annually by an approved inspection agency or a company that is registered with the US Department of Transportation to requalify LP-gas cylinders, to ensure that system components are free from damage, suitable for the intended service and not subject to leaking. CNG containers shall be inspected every 3 years in a qualified service facility. CNG containers shall not be used past their expiration date as listed on the manufacturer's container label. Upon satisfactory inspection, the approved inspection agency shall affix a tag on the fuel-gas system or within the vehicle indicating the name of the inspection agency and the date of satisfactory inspection.~~

[NY] CHAPTER 4~~0~~2 SUGARHOUSE ALTERNATIVE ACTIVITY PROVISIONS

Note: All subsections are renumbered to match the new chapter number. Sections which are otherwise unchanged are omitted for clarity.

~~4002~~ 4202 Definitions

~~**[NY] REGISTERED DESIGN PROFESSIONAL.** An individual who is a registered architect (RA) in accordance with Article 147 of the New York State Education Law or a registered professional engineer (PE) in accordance with Article 145 of the New York State Education Law.~~

CHAPTER 50 HAZARDOUS MATERIALS—GENERAL PROVISIONS

5001.1 Scope. Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or wholesale sales occupancies, ~~the quantities of~~ medicines, foodstuff, cosmetics and commercial or ~~consumer~~ institutional products ~~and cosmetics~~ containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable ~~shall not be limited~~, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).

2. ~~Quantities of~~ Alcoholic beverages in retail or wholesale sales occupancies ~~shall not be limited providing~~ provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L)

3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.

4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.

5. Building materials not otherwise regulated by this code.

6. Refrigeration systems (see Section 608).

7. Stationary storage battery systems regulated by Section 1207.

8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.

9. *Corrosives* utilized in personal and household products in the manufacturer's original consumer packaging in Group M occupancies.

10. The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.

11. The use, storage, or both of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.

12. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.

13. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 605. For abandonment of fuel oil tanks, Chapter 57 applies.

14. Storage and display of aerosol products complying with Chapter 51.

15. Storage and use of *flammable* or *combustible liquids* that do not have a fire point when tested in accordance with ASTM D92, not otherwise regulated by this code.

16. *Flammable* or *combustible liquids* with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion, not otherwise regulated by this code.

17. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 607 and NFPA 30.

TABLE 5003.1.1(1)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, c, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note ~~q~~ p	NA	NA	See Note ~~q~~ p	NA	NA	See Note ~~q~~ p	NA
Combustible fiber~~q~~ p	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled~~o~~		(1,000)			(1,000)			(200)	
Combustible liquid[c, ~~i~~, o]	II	H-2 or H-3	NA	120[d, e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Cryogenic Flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic Oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous	H-2	NA	NA		NA	NA		NA	NA
	1A and 1B (High BV)[s]				1,000[d, e]			1,000[d,e]		
	1B (Low BV)[s]				162,500[d,e]			162,500[d,e]		
	Liquefied				NA			NA		
	1A and 1B (High BV)[s]			(150)[d, e]			(150)[d, e]			

	1B (Low BV)[s]			(10,000)[d,e]			(10,000)[d,e]			
Flammable liquid[eo]	IA IB and IC	H-2 or H-3	NA	30[d, e] 120[d, e]	NA	NA	30[d] 120[d]	NA	NA	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)[o]	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d,e]	10[d,e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous	H-3	NA	NA	1,500[d,e]	NA	NA	1,500[d,e]	NA	NA
	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3	H-2	5[d,e]	(5)[d,e]	NA	5[d]	(5)[d]	NA	1[d]	(1)[d]
	2	H-3	50[d,e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	1	NA	NL	NL		NL	NL		NL	NL

For SI: 1 cubic foot = 0.02832 m , 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~listed~~ for storage, including applicable increases.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 of the *International Building Code* and Chapter 38. ~~The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of~~

~~the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2.~~

Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

j. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

k. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.

l. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

m. For ~~storage and display quantities~~ oxidizers, unstable (reactive) materials, and water reactive materials stored or displayed in Group M occupancies ~~and storage quantities~~ or stored in Group S occupancies, see ~~complying with~~ Section 5003.11~~, see Table 5003.11.1~~.

n. ~~Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.~~ For flammable and combustible liquid storage in Group M occupancy wholesale and retail sales uses, see Section 5704.3.6.

~~o.~~ Quantities in this table shall be modified in accordance with Table 5003.1.1(5). ~~The following shall not be included in determining the maximum allowable quantities:~~

~~a. Liquid or gaseous fuel in fuel tanks on vehicles.~~

~~b. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.~~

~~c. Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.~~

~~d. Liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code.~~

~~e. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.~~

p. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2.

q. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

TABLE 5003.1.1(2)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD[a, c, f, h, i, j]

MATERIAL	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
	Solid pounds[d,e,f]	Liquid gallons (pounds)[d,e,f]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]	Gas cubic feet at NTP (pounds)[d]	Solid pounds[d]	Liquid gallons (pounds)[d]
Corrosives	5,000	500	Gaseous 810[e] Liquefied (150)	5,000	500	Gaseous 810[e] Liquefied (150)	1,000	100
Highly toxics	10	(10)	Gaseous 20[g] Liquefied (4)[g]	10	(10)	Gaseous 20[g] Liquefied (4)[g]	3	(3)
Toxics	500	(500)	Gaseous 810[e] Liquefied (150)[e]	500	(500)	Gaseous 810[e] Liquefied (150)[e]	125	(125)

For SI: 1 cubic foot = 0.02832 m , 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the maximum allowable quantity ~~listed~~ for storage, including applicable increases.

c. For hazardous materials in Group B higher education laboratory occupancies, See Section 428 of the International Building Code and Chapter 38. ~~In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics, containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.~~

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures. Where Note d applies, the increase for both notes shall be applied accumulatively.

~~f.~~ For corrosive, highly toxic and toxic materials stored or displayed in Group M occupancies or stored in Group S occupancies, See Section 5003.11.1. ~~For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.~~

g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures.

h. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

j. Quantities in this table shall be modified in accordance with Table 5003.1.1(5).

TABLE 5003.1.1(3)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, d]

Portions of table not shown remain unchanged.

MATERIAL	CLASS	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
		Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)[d]
Flammable gas	Gaseous	Not Applicable			Not Applicable			Not Applicable	Not Applicable
	1A and 1B (High BV)[e]		Not Applicable	3,000		Not Applicable	1,500		

	1B (Low BV)[e]			195,000			97,500		
	Liquefied								
	1A and 1B (High BV)[e]		(300)	Not Applicable		(150)	Not Applicable		
	1B (Low BV)[e]		(20,000)			(10,000)			
Flammable solid	Not Applicable	500	Not Applicable	Not Applicable	250	Not Applicable	Not Applicable	50	Not Applicable
Inert Gas Cryogenic inert	Gaseous	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable
	Liquefied								
	Not Applicable								
Organic peroxide	Unclassified Detonable	1	(1)	Not Applicable	0.25	(0.25)	Not Applicable	0.25	(0.25)
Organic peroxide	I	20	(20)	Not Applicable	10	(10)	Not Applicable	2	(2)
	II	200	(200)		100	(100)		20	(20)
	III	500	(500)		250	(250)		50	(50)
	IV	Not Limited	Not Limited		Not Limited	Not Limited		Not Limited	Not Limited
	V	Not Limited	Not Limited		Not Limited	Not Limited		Not Limited	Not Limited
Oxidizer	4	2	(2)	Not Applicable	1	(1)	Not Applicable	0.25	(0.25)
	3	40	(40)		20	(20)		4	(4)
	2	1,000	(1,000)		500	(500)		1,00	(1,00)
	1	Not Limited	Not Limited		Not Limited	Not Limited		Not Limited	Not Limited
Oxidizing gas	Gaseous	Not Applicable	6,000	Not Applicable	Not Applicable	(300)	1,500	Not Applicable	Not Applicable
	Liquefied	(600)	Not Applicable			Not Applicable	Not Applicable		
Pyrophoric materials	Not Applicable	8	(8)	100	4	(4)	10	0	0
Unstable (reactive)	4	2	(2)	20	1	(1)	2	0.25	(0.25)
	3	20	(20)	200	10	(10)	10	1	(1)
	2	200	(200)	1,000	100	(100)	250	10	(10)
	1	Not Limited	Not Limited	~~1,500~~ Not Limited	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited
Water reactive	3	20	(20)	Not applicable	10	(10)	Not applicable	1	(1)
	2	200	(200)		100	(100)		10	(10)
	1	Not Limited	Not Limited		Not Limited	Not Limited		Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m .

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the maximum allowable quantity ~~listed~~ for storage, including applicable increases.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

e. "High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

TABLE 5003.1.1(4)

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD IN AN OUTDOOR CONTROL AREA[a, b, c, f]

MATERIAL	STORAGE			USE-CLOSED SYSTEMS			USE-OPEN SYSTEMS	
	Solid pounds	Liquid gallons (pounds)	Gas cubic feet at NTP (pounds)	Solid pounds	Liquid gallons (pounds)	Gas cubic feet at NTP (pounds)	Solid pounds	Liquid gallons (pounds)
Corrosives	20,000	2,000	Gaseous 1,620 Liquefied (300)	10,000	1,000	Gaseous 810 Liquefied (150)	1,000	100
Highly toxics	20	(20)	Gaseous 40[d] Liquefied (8)[d]	10	(10)	Gaseous 20[d] Liquefied (4)[d]	3	(3)
Toxics	1,000	(l,000)[e]	Gaseous 1,620 Liquefied (300)	500	50[e]	Gaseous 810 Liquefied (150)	125	(125)[e]

For SI:1 cubic foot = 0.02832 m , 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 pound per square inch absolute = 6.895 kPa,°C = (°F – 32)/1.8.

a. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.

b. The aggregate quantities in storage and use shall not exceed the maximum allowable quantity ~~listed~~ for storage, including applicable increases.

c. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed in outdoor storage per single property under the same ownership or control used for retail or wholesale sales is allowed to exceed the maximum allowable quantity per control area where such storage is in accordance with Section 5003.11.

d. Allowed only where used in approved exhausted gas cabinets, exhausted enclosures or under fume hoods.

e. The maximum allowable quantity per control area for toxic liquids with vapor pressures in excess of 1 psia at 77°F shall be the maximum allowable quantity per control area listed for highly toxic liquids.

f. Quantities in parentheses indicate quantity units in parentheses at the head of each column.

TABLE 5003.1.1(5)

HAZARDOUS MATERIAL EXEMPTIONS [a]

Material Classification	Occupancy or Application	Exemption
Combustible fiber	Baled Cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115

Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices is not limited
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers is not limited
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for aerosol product storage, aerosol cooking spray products or plastic aerosol 3 products shall be classified as Group S-1
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F (60°C) is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers or 1-hour horizontal assemblies, or both, constructed in accordance with the International Building Code
		The quantity of combustible liquid solvents having a flash point at or above 200°F (93°C) is not limited
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes shall comply with Section 416.
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited
	Fuel oil	The quantity of fuel oil storage complying with Section 605.4.2 is not limited
	Hand sanitizer	The quantity of alcohol-based hand rubs classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 is not limited. The location of the alcohol- based hand rub (ABHR) dispensers shall be provided in the construction documents

	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilized for agricultural purposes on the premises is not limited
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited
		The quantity of hazardous materials in stationary fuel cell power systems is not limited
		The quantity of hazardous materials in capacitor energy storage systems is not limited
	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited.

a. Exempted materials and conditions listed in this table are required to comply with provisions of this code that are not based on exceeding maximum allowable quantities in Section 5003.

5003.2.2.1 Design and construction. Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.

2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.

3. Manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing and provided with ready access at the following locations:

3.1. The point of use.

3.2. The tank, cylinder or bulk source.

4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be ~~identified and the location shall have access~~ clearly visible ~~and indicated by means of a sign~~, provided with *ready access* and identified in an *approved* manner.

5. Backflow prevention or check valves shall be provided where the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

Exceptions:

1. Piping for inlet connections designed to prevent backflow.

2. Piping for pressure relief devices.

5003.7.4 Respiratory therapy. In Group I-2 and ambulatory care facilities, within areas with respiratory therapy services, sources of ignition shall be regulated in accordance with NFPA 99.

TABLE 5003.8.2

DETACHED BUILDING REQUIRED

A DETACHED BUILDING IS REQUIRED WHERE THE QUANTITY OF MATERIAL EXCEEDS THAT SPECIFIED HEREIN			
Material	**Class**	**Solids and Liquids (tons)[a, b]**	**Gases (cubic feet)[a, b]**
Explosives	Division 1.1	Maximum Allowable Quantity	Not Applicable
	Division 1.2	Maximum Allowable Quantity	
	Division 1.3	Maximum Allowable Quantity	
	Division 1.4 [e]	Maximum Allowable Quantity	
	Division 1.4[c, e]	1	
	Division 1.5	Maximum Allowable Quantity	
	Division 1.6	Maximum Allowable Quantity	

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 m^3, 1 ton = 2000 lb = 907.2 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of the International Building Code or Chapter 56 based on the trinitrotoluene (TNT) equivalence of the material, whichever is greater.

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 5003.1.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

d. Detached buildings are not required for gases in gas rooms that support H-5 fabrication facilities where the gas room is separated from other areas by a fire barrier with a fire-resistance rating of not less than 2 hours and the gas is located in a gas cabinet that is internally sprinklered, equipped with continuous leak detection, automatic shutdown, and is not manifolded upstream of pressure controls. The gas supply is limited to cylinders that do not exceed 125 pounds water capacity in accordance with DOTn 49 CFR 173.192 for Hazard Zone A toxic gases.

e. Does not apply to consumer fireworks, Division 1.4G.

5003.8.3.3 Number. The maximum number of control areas per floor within a building shall be in accordance with Table 5003.8.3.2. For the purposes of determining the number of *control areas* within a building, each portion of a building separated by one or more *fire walls* complying with Section 706 of the *International Building Code* shall be considered a separate building.

5003.8.3.5 Hazardous materials in Group M display and storage areas and in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 5003.8.3.5.1 through ~~5003.8.3.5.3~~ 5003.8.3.5.4.

5003.8.3.5.4 Flammable gas. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, in an outdoor control area, or stored in a single control area of a Group S occupancy is allowed to exceed the maximum allowable quantities per *control area* specified in Table 5003.1.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with Section 5003.11.2.

5003.8.7 Hazardous materials storage cabinets. Where storage cabinets are used to increase maximum allowable quantity per control area or to comply with this chapter, such cabinets shall be in accordance with Sections 5003.8.7.1 through ~~and 5003.8.7.2.~~ 5003.8.7.4.

5003.8.7.1 Construction. The interior of cabinets shall be treated, coated or constructed of materials that are nonreactive with the hazardous material stored. Such treatment, coating or construction shall include the entire interior of the cabinet. Cabinets shall either be listed in accordance with UL 1275 as suitable for the intended storage or constructed in accordance with the following:

1. Cabinets shall be of steel having a thickness of not less than 0.0478 inch (1.2 mm) (No. 18 gage). The cabinet, including the door, shall be double walled with a 1 / -inch (38 mm) airspace between the walls. Joints shall be

riveted or welded and shall be tight fitting. ~~Doors shall be well fitted, self-closing and equipped with a self-latching device.~~

2. The bottoms of cabinets utilized for the storage of liquids shall be liquid tight to a minimum height of 2 inches (51 mm).

~~Electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids shall be in accordance with NFPA 70.~~

5003.8.7.2 Doors. Doors shall be well fitted, self-closing and equipped with a self-latching device.

5003.8.7.3 Electrical. Electrical equipment and devices within cabinets used for the storage of hazardous gases or liquids shall be in accordance with NFPA 70.

~~**5003.8.7.2**~~ **5003.8.7.4 Warning markings.** Cabinets shall be clearly identified in an *approved* manner with red letters on a contrasting background to read:

HAZARDOUS—KEEP FIRE AWAY

5003.9.9 Shelf storage. Shelving shall be of substantial construction, and shall be braced and anchored in accordance with the seismic design requirements of the International Building Code for the seismic design category ~~zone~~ in which the material is located. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard where used for the storage of individual containers.

Shelf storage of hazardous materials shall be maintained in an orderly manner.

Exceptions:

1. Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use.

2. Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5.

5003.11 Group M storage and display and Group S storage. The aggregate quantity of ~~nonflammable solid and nonflammable or noncombustible liquid~~ hazardous materials stored and displayed within a single control area of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy, is allowed to exceed the maximum allowable quantity per control area indicated in Section 5003.1 where in accordance with Sections 5003.11.1 and 5003.11.2 ~~through 5003.11.3.11~~.

5003.11.1 Nonflammable solid and nonflammable or noncombustible liquid hazardous materials ~~Maximum allowable quantity per outdoor control area in Group M or S occupancies~~. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single *control area* of a Group M occupancy, in an *outdoor control area*, or stored in a single *control area* of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.1.

TABLE 5003.11.1 MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES— NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS[d, e, f]

Portions of table not shown remain unchanged.

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material[a]	**Class**	**Solids (pounds)**	**Liquids (gallons)**
A. Health-Hazard Materials—Nonflammable and Noncombustible Solids and Liquids			
1. Corrosives[b, c]	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20[b, c]	2[b, c]
3. Toxics[b, c]	Not Applicable	1,000[k]	100

B. Physical-Hazard Materials—Nonflammable and Noncombustible Solids and Liquids			
1. Oxidizers[b, c]	4	Not Allowed	Not Allowed
	3	1,500[g]	150
	2	2,250[h]	225
	1	18,000[i, j]	1,800[i, j]
2. Unstable (reactives)[b, c]	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water reactives	3b, c	550	55
	2b, c	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m .

a. Hazard categories are as specified in Section 5001.2.2.

b. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note c applies, the increase for both notes shall be applied accumulatively.

c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets in accordance with Section 5003.8. Where Note b applies, the increase for both notes shall be applied accumulatively.

d. See Table 5003.8.3.2 for design and number of control areas.

e. Maximum allowable quantities for other hazardous material categories shall be in accordance with Section 5003.1.

f. Maximum allowable quantities shall be increased 100 percent in outdoor control areas.

g. Maximum allowable quantities shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

h. Maximum allowable quantities shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.

i. Quantities are unlimited where protected by an automatic sprinkler system.

j. Quantities are unlimited in an outdoor control area.

k. Maximum allowable quantity of consumer products shall be increased to 10,000 pounds where individual packages are in the original sealed containers from the manufacturer and the toxic classification is exclusively based on the LC_{50} threshold and no other hazardous materials classifications apply.

~~**5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies.** The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single outdoor control area of a Group M occupancy shall not exceed the amounts set forth in Table 5003.11.1.~~

~~5003.11.3~~ 5003.11.1.1 **Storage and display.** Storage and display shall be in accordance with Sections ~~5003.11.3.1~~ 5003.1.1.1 through ~~5003.11.3.11~~ 5003.11.1.1.11.

~~5003.11.3.1~~ 5003.11.1.1.1 **Density.** Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m^2) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m^2) of floor area actually occupied by liquid merchandise.

~~5003.11.3.2~~ 5003.11.1.1.2 **Storage and display height.** Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

~~5003.11.3.3~~ 5003.11.1.1.3 **Container location.** Individual containers less than 5 gallons (19 L) or less than 25 pounds (11 kg) shall be stored or displayed on pallets, racks or shelves.

~~5003.11.3.4~~ 5003.11.1.1.4 **Racks and shelves.** Racks and shelves used for storage or display shall be in accordance with Section 5003.9.9.

~~5003.11.3.5~~ 5003.11.1.1.5 **Container type.** Containers shall be *approved* for the intended use and identified as to their content.

~~5003.11.3.7~~ 5003.11.1.1.7 **Incompatible materials.** *Incompatible materials* shall be separated in accordance with Section 5003.9.8.

~~5003.11.3.6~~ 5003.11.1.1.6 **Container size.** Individual containers shall not exceed 100 pounds (45 kg) for solids or 10 gallons (38 L) for liquids in storage and display areas.

~~5003.11.3.8~~ 5003.11.1.1.8 **Floors.** Floors shall be in accordance with Section 5004.12.

~~5003.11.3.9~~ 5003.11.1.1.9 **Aisles.** Aisles 4 feet (1219 mm) in width shall be maintained on three sides of the storage or display area.

~~5003.11.3.10~~ 5003.11.1.1.10 **Signs.** Hazard identification signs shall be provided in accordance with Section 5003.5.

~~5003.11.3.11~~ 5003.11.1.1.11 **Storage plan.** A storage plan illustrating the intended storage arrangement, including the location and dimensions of aisles, and storage racks shall be provided.

5003.11.2 Category 1B flammable gas with low burning velocity. The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single control area of a Group M occupancy, in an outdoor control area, or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in Table 5003.11.2.

TABLE 5003.11.2

MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE - GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

Category 1B (Low BV)[d]	Sprinklered in accordance with Note b	Nonsprinklered
Gaseous	390,000 cu. ft.	195,000 cu. ft
Liquefied	40,000 lbs.[c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cu. ft. = 0.028 m3

a. Control areas shall be separated from each other by not less than a 1-hour fire barrier.

b. The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.

c. Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area is allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.

d. "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

5003.11.2.1 Fire protection and storage arrangements. Fire protection and container storage arrangements for quantities of Category 1B flammable gases permitted by Table 5003.11.2 shall be in accordance with the all of the following:

1. Storage of the Category 1B flammable gases on shelves shall not exceed 6 feet (1829 mm) in height, and shelving shall be metal.
2. Rack storage, pallet storage or piles of the Category 1B flammable gas greater than 6 feet 6 inches (1981 mm) in height shall be provided with an automatic sprinkler system with a minimum design density of Extra Hazard Group 1.
3. Combustible commodities shall not be stored above the Category 1B flammable gases.
4. Flammable liquids shall be separated from the Category 1B flammable gases by a distance 20 feet (6096 mm). The separation is permitted to be reduced to 10 feet (3048 mm) where secondary containment or diking is provided to retain a flammable liquid spill at a distance of 10 feet (3048 mm) from the Category 1B flammable gas storage.

5003.12 Outdoor control areas. *Outdoor control areas* for hazardous materials ~~in amounts not exceeding the maximum allowable quantity per outdoor control area~~ shall be in accordance with the following general requirements:

1. 1.Outdoor control areas shall be kept free from weeds, debris and common combustible materials not necessary to the storage. The area surrounding an outdoor control area shall be kept clear of such materials for not less than 15 feet (4572 mm).
2. 2.Outdoor control areas shall be located not closer than 20 feet (6096 mm) from a public street, public alley, public way or lot line that can be built on.

Exceptions:

1. For solid and liquid hazardous materials, a 2-hour fire-resistance-rated wall without openings extending not less than 30 inches (762 mm) above and to the sides of the storage area shall be allowed in lieu of such distance.
2. For compressed gas hazardous materials, unless otherwise specified, the minimum required distances shall not apply where fire barriers without openings or penetrations having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the storage and the exposure. The configuration of the fire barrier shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.
3. Where a property exceeds 10,000 square feet (929 m^2), a group of two outdoor control areas is allowed where approved and where each control area is separated by a minimum distance of 50 feet (15 240 mm).
4. Where a property exceeds 35,000 square feet (3252 m^2), additional groups of outdoor control areas are allowed where approved and where each group is separated by a minimum distance of 300 feet (91 440 mm).

5003.13 Outdoor rooftop storage, use and handling. Storage, use and handling and use of hazardous materials on top of roofs or canopies shall be classified as rooftop storage or use and shall comply with Sections 5003.13.1 through 5003.13.5.

5003.13.1 Occupancy classification. Quantities of hazardous materials stored, used or handled on top of roofs or canopies shall be classified as rooftop storage or use and shall not be used to determine the occupancy classification of the building.

5003.13.2 Maximum allowable quantity per rooftop or canopy. The storage, use and handling of hazardous materials on top of a roof or canopy shall not exceed the maximum allowable quantity set forth in Tables 5003.1.1(1) and Table 5003.1.1(2). LP Gas storage and use shall be in accordance with Chapter 61.

Exceptions:

1. Pollution control, exhaust treatment and dust collection equipment.
2. *Combustible liquids* complying with Chapter 57 and NFPA 30.
3. Hydrogen storage at motor fuel dispensing facilities in accordance with Chapter 23.

4. Hazardous materials in closed piping systems complying with this code.

5. Hazardous materials on top of a normally unoccupied exterior equipment platform necessary for operation of mechanical systems or industrial process equipment.

6. Hazardous materials necessary for rooftop swimming pool or hot tub treatment systems, limited to maximum containers size of 50 gallons (189 L) or 500 pounds (227 kg) of toxic or *corrosive* materials, and 200 pounds (91 kg) or 20 gallons (76 L) of *oxidizers*.

7. Other situations where rooftop storage or use of hazardous materials is necessary for operation of equipment serving the building and is *approved*.

5003.13.3 Story adjustment. In addition to the quantity limits in 5003.13.2, rooftop storage and use shall be limited to the percentage of maximum allowable quantity identified in Table 5003.8.3.2 based on the number of stories above grade of the building on which the roof is located.

5003.13.4 Other requirements. In addition to the quantity limits of this section, rooftop storage and use shall comply with other applicable requirements of this code for outdoor storage. This section applies to the exceptions identified in 5003.13.2.

5003.13.5 Weather protection. Weather protection provided for sheltering rooftop storage or use it shall comply with Section 414.6.1 of the *International Building Code*, except that there is no distance required to the building on which it is located.

5004.3 Ventilation. Indoor storage areas and storage buildings shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

~~**Exception**~~ **Exceptions:**

1.Storage areas for flammable solids complying with Chapter 59.

2.Storage areas for medical gases complying with Chapter 53.

5004.14 Outdoor storage location. Outdoor storage areas for hazardous materials shall be located as required by Section 5003.12 except where material specific requirements, including requirements in referenced standards, are provided in other chapters of this code.

5005.1.8 Fire ~~extinguishing~~ protection systems. Indoor rooms or areas in which hazardous materials are dispensed or used shall be protected by an *automatic sprinkler system* or *automatic fire-extinguishing system* in accordance with Chapter 9. Sprinkler system design shall be not less than that required for Ordinary Hazard, Group 2, with a minimum design area of 3,000 square feet (279 m^2). Where the materials or storage arrangement are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.

5005.4.3 ~~Location.~~ Outdoor location. Outdoor handling areas for hazardous materials shall be located as required by Section 5003.12 except where material specific requirements, including requirements in referenced standards, are provided in other chapters of this code. ~~for outdoor storage in accordance with Section 5004.~~

CHAPTER 51 AEROSOLS

5101.1 Scope. The provisions of this chapter, the International Building Code and NFPA 30B shall apply to the manufacturing, storage and display of aerosol products, aerosol cooking spray products and plastic aerosol 3 products. Manufacturing of aerosol products, aerosol cooking spray products and plastic aerosol 3 products using hazardous materials shall also comply with Chapter 50.

5101.4 Containers. Metal aerosol containers shall be limited to a maximum size of 33.8 fluid ounces (1000 ml). Plastic aerosol containers shall be limited to a maximum 4 fluid ounces (118 ml) except as provided in Section 5104.1.1 and 5104.1.2. Glass aerosol containers shall be limited to a maximum 4 fluid ounces (118 ml).

5103.2.3 Plastic aerosol products. Cartons or outer packaging containing aerosol products in plastic containers greater than 4 fluid ounces (118 ml) shall be clearly marked as follows: PLASTIC AEROSOL 1 ~~(~~, 3 or X~~)~~

5104.1 General. The inside storage of Level 2 and 3 aerosol products, aerosol cooking sprays and plastic aerosol 3 products, shall comply with Sections 5104.2 through 5104.8 and NFPA 30B. Level 1 aerosol products and those aerosol products covered by Section 5104.1.1 shall be considered to be equivalent to a Class III commodity and shall comply with the requirements for palletized or rack storage in NFPA 13.

5104.1.1 Plastic ~~level 1~~ aerosol 1 products. Aerosol products in plastic containers larger than 4 fluid ounces (118 ml), but not to exceed 33.8 fluid ounces (1000 ml), shall be allowed only where in accordance with this section. The commodity classification shall be Class III commodities, as defined in NFPA 13 where any of the following conditions are met:

1. Base product does not have a fire point where tested in accordance with ASTM D92, and nonflammable propellant.

2. Base product does not sustain combustion as tested in accordance with DOTn 49 CFR Part 173, Appendix H, and nonflammable propellant.

3. Base product contains up to 20 percent by volume (15.8 percent by weight) of ethanol, isopropyl alcohol or a combination thereof in an aqueous mix, and nonflammable propellant.

4. Base product contains 4 percent by weight or less of an emulsified flammable liquefied gas propellant within an aqueous base. The propellant shall remain emulsified for the life of the product. Where such propellant is not permanently emulsified, the propellant shall be nonflammable.

5104.1.2 Plastic aerosol 3 products. Plastic aerosol 3 products shall be defined as those that meet one of the following criteria:

1.Base product does not have a fire point where tested in accordance with ASTM D92, and there is not more than 10 percent by weight flammable propellant.

2.Base product does not sustain combustion as tested in accordance with DOTn 49 CFR, 173, Appendix H, and there is not more than 10 percent by weight flammable propellant.

3.Base product contains 50 percent by volume or less of flammable or combustible, water-miscible alcohols in an aqueous mix, and there is not more than 10 percent by weight of flammable propellant.

~~**5104.1.2**~~ **5104.1.3 Plastic aerosol X products.** Plastic aerosol X products are those products, in containers larger than 4 fluid ounces (118 ml), that do not meet the criteria provided in Section 5104.1.1 or 5104.1.2.

5104.2 Storage in Groups A, B, E, F, I and R. Storage of Level 2 and 3 aerosol and plastic aerosol 3 products in occupancies in Groups A, B, E, F, I and R shall be limited to the following maximum quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.

2. A net weight of 500 pounds (227 kg) of Level 3 aerosol and plastic aerosol 3 products.

3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol, and plastic aerosol 3 products.

The maximum quantity shall be increased 100 percent where the excess quantity is stored in storage cabinets in accordance with Section 5704.3.2.

5104.2.2 Aerosol cooking spray products. Storage of aerosol cooking spray products in A, B, E, F, I and R occupancies shall not be more than 1,000 pounds (454 kg) net weight.

5104.3.1 Nonsegregated storage. Storage consisting of solid pile, palletized or rack storage of Level 2 and 3 aerosol and plastic aerosol 3 products not segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.1.

TABLE 5104.3.1 NONSEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL AND PLASTIC AEROSOL 3 PRODUCTS IN GENERAL PURPOSE WAREHOUSES [b]

AEROSOL LEVEL	MAXIMUM NET WEIGHT PER FLOOR (pounds)[b]	
	Palletized or solid-pile storage	Rack storage

	Unprotected	Protected[a]	Unprotected	Protected[a]
2	2,500	12,000	2,500	24,000
3 and plastic aerosol 3	1,000	12,000	1,000	24,000
Combination 2, ~~and~~ 3 and plastic aerosol 3	2,500	12,000	2,500	24,000

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 square foot = 0.0929 m.

a. Approved automatic sprinkler system protection and storage arrangements shall comply with NFPA 30B. Sprinkler system protection shall extend 20 feet beyond the storage area containing the aerosol products.

b. Storage quantities indicated are the maximum permitted in any 50,000-square-foot area.

5104.3.2 Segregated storage. Storage of Level 2 and 3 aerosol and plastic aerosol 3 products segregated into areas utilized exclusively for the storage of aerosol products shall comply with Table 5104.3.2 and Sections 5104.3.2.1 and 5104.3.2.2.

TABLE 5104.3.2 SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS IN GENERAL PURPOSE WAREHOUSES

STORAGE SEPARATION	MAXIMUM SEGREGATED STORAGE AREA[a]		AUTOMATIC SPRINKLER SYSTEM REQUIREMENTS
	Percentage of building area (percent)	Area limitation (square feet)	
Separation area[e, f]	15	20,000	Notes b, c
Chain-link fence enclosure[d]	20	20,000	Notes b, c
1-hour fire-resistance-rated interior walls	20	30,000	Note b
2-hour fire-resistance-rated interior walls	25	40,000	Note b
3-hour fire-resistance-rated interior walls	30	50,000	Note b

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

a. The maximum segregated storage area shall be limited to the smaller of the two areas resulting from the percentage of building area limitation and the area limitation.

b. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Building areas not containing aerosol product storage shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

c. Automatic sprinkler system protection in aerosol product storage areas shall comply with NFPA 30B and be approved. Sprinkler system protection shall extend a minimum 20 feet beyond the aerosol storage area.

d. Chain-link fence enclosures shall comply with Section 5104.3.2.1.

e. A separation area shall be defined as an area extending outward from the periphery of the segregated aerosol product storage area as follows:

1. The limits of the aerosol product storage shall be clearly marked on the floor.
2. The separation distance shall be not less than 25 feet and maintained clear of all materials with a commodity classification greater than Class III in accordance with Section 903.3.1.1.

f. Separation areas shall only be permitted where approved.

5104.4 Storage in aerosol product warehouses. The total quantity of Level 2 and 3 aerosol products, aerosol cooking sprays and plastic aerosol 3 products in a warehouse utilized for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with Sections 5104.4.1 through 5104.4.4.

5104.5.1 Storage rooms of 500 square feet or less. The storage of aerosol products in flammable liquid storage rooms less than or equal to 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products.
2. A net weight of 500 pounds (227 kg) of Level 3 aerosol and plastic aerosol 3 products.
3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol and plastic aerosol 3 products.

5104.5.2 Storage rooms greater than 500 square feet. The storage of aerosol products in *flammable liquid* storage rooms greater than 500 square feet (46 m^2) in area shall not exceed the following quantities:

1. A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products.
2. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol and plastic aerosol 3 products.
3. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol and plastic aerosol 3 products.

The maximum aggregate storage quantity of Level 2 and 3 aerosol and plastic aerosol 3 products permitted in separate inside storage rooms protected by an *approved automatic sprinkler system* in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).

5104.7 Storage in Group M occupancies. Storage of Level 2 and 3 aerosol products ~~and~~, aerosol cooking spray products, and plastic aerosol 3 products in occupancies in Group M shall comply with Table 5104.7. Retail display shall comply with Section 5106.

TABLE 5104.7 MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS ~~AND~~, AEROSOL COOKING SPRAY PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS IN RETAIL STORAGE AREAS

MAXIMUM NET WEIGHT PER FLOOR (pounds)			
Floor	**Nonsegregated storage[a, b]**	**Segregated storage**	
		Storage cabinets[b]	**Separated from retail area[c]**
Basement	Not Permitted	Not Permitted	Not Permitted
Ground	2,500	5,000	Note d
Upper	500	1,000	Note d

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. The total aggregate quantity on display and in storage shall not exceed the maximum retail display quantity indicated in Section 5106.3.

b. Storage quantities indicated are the maximum permitted in any 50,000- square-foot area.

c. The storage area shall be separated from the retail area with a 1-hour fire-resistance-rated assembly.

d. See Table 5104.3.2.

5105.1 General. The outside storage of Level 2 and 3 aerosol products, and plastic aerosol 3 products including storage in temporary storage trailers, shall be separated from exposures in accordance with Table 5105.1**.**

TABLE 5105.1 DISTANCE TO EXPOSURES FOR OUTSIDE STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS

EXPOSURE	MINIMUM DISTANCE FROM AEROSOL STORAGE (feet)[a]
Buildings	50
Exit discharge to a public way	50
Lot lines	20
Other outside storage	50
Public alleys, public ways, public streets	20

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The minimum separation distance indicated is not required where exterior walls having a 2-hour fire-resistance rating without penetrations separate the storage from the exposure. The walls shall extend not less than 30 inches above and to the sides of Level 2 and 3 aerosol products, and plastic aerosol 3 products.

5106.1 General. This section shall apply to the retail display of 500 pounds (227 kg) or more of Level 2 and 3 aerosol products ~~and~~, aerosol cooking spray products and plastic aerosol 3 products

5106.2.1 Maximum quantities in retail display areas. Aerosol products ~~and~~, aerosol cooking spray products and plastic aerosol 3 products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in Table 5106.2.1.

TABLE 5106.2.1 MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS, ~~AND~~ AEROSOL COOKING SPRAY PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS IN RETAIL DISPLAY AREAS

MAXIMUM NET WEIGHT PER FLOOR (pounds)[b]			
Floor	**Unprotected[a]**	**Protected in accordance with Section 5106.2[a, c]**	**Protected in accordance with Section 5106.3[c]**
Basement	Not Allowed	500	500
Ground	2,500	10,000	10,000
Upper	500	2,000	Not Allowed

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. The total quantity shall not exceed 1,000 pounds net weight in any one 100-square-foot retail display area.

b. Per 25,000-square-foot retail display area.

c. Minimum Ordinary Hazard Group 2 wet-pipe automatic sprinkler system throughout the retail sales occupancy.

5106.2.2 Aerosol cooking spray product storage and fire protection. The storage and handling of aerosol cooking spray products shall comply with this chapter and NFPA 30B.

5106.2.3 Display of aerosol products. Level 2 and 3 aerosol and plastic aerosol 3 products shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol product array to the top of the aerosol product array unless the aerosol products are placed on fixed shelving or otherwise secured in an *approved* manner. Where storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol products shall not exceed 8 feet (2438 mm).

5106.3.2 Automatic sprinkler protection. Aerosol product and plastic aerosol 3 product display and merchandising areas shall be protected by an automatic sprinkler system based on the requirements set forth in Tables 6.4.2.7(a) through 6.4.2.7(1) of NFPA 30B and the following:

1. Protection shall be based on the highest level of aerosol product in the array and the packaging method of the storage located more than 6 feet (1829 mm) above the finished floor.
2. Where using the cartoned aerosol products tables of NFPA 30B, uncartoned or display-cut Level 2 and 3 aerosol products and plastic aerosol 3 products shall not be permitted more than 6 feet (1829 mm) above the finished floor.
3. The design area for Level 2 and 3 aerosol products and plastic aerosol 3 products shall extend not less than 20 feet (6096 mm) beyond the Level 2 and 3 aerosol product and plastic aerosol 3 product display and merchandising areas.
4. Where ordinary and high-temperature ceiling sprinkler systems are adjacent to each other, noncombustible draft curtains shall be installed at the interface.

5106.3.3 Separation of Level 2 and 3 aerosol product and plastic aerosol 3 product areas. Separation of Level 2 and 3 aerosol product areas or plastic aerosol 3 product areas shall comply with the following:

1. Level 2 and 3 aerosol product or plastic aerosol 3 product display and merchandising areas shall be separated from each other by not less than 25 feet (7620 mm). See Table 5106.2.1.
2. Level 2 and 3 aerosol product or plastic aerosol 3 product display and merchandising areas shall be separated from flammable and combustible liquids storage and display areas by one or a combination of the following:

    2.1. Segregating areas from each other by horizontal distance of not less than 25 feet (7620 mm).

    2.2. Isolating areas from each other by a noncombustible partition extending not less than 18 inches (457 mm) above the merchandise.

    2.3. In accordance with Section 5106.5.

3. Where Item 2.2 is used to separate Level 2 or 3 aerosol products or plastic aerosol 3 products from flammable or combustible liquids, and the aerosol products are located within 25 feet (7620 mm) of flammable or combustible liquids, the area below the noncombustible partition shall be liquid tight at the floor to prevent spilled liquids from flowing beneath the aerosol products.

TABLE 5106.4 MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND 3 AEROSOL PRODUCTS AND PLASTIC AEROSOL 3 PRODUCTS

MAXIMUM NET WEIGHT PER FLOOR (pounds)			
Floor	**Unseparated[a, b]**	**Separated**	
		Storage Cabinets[b]	1-hour Occupancy Separation
Basement	Not Allowed	Not Allowed	Not Allowed

Ground	2,500	5,000	In accordance with Sections 6.4.4.3 and 6.4.4.4 of NFPA 30B
Upper	500	1,000	In accordance with Sections 6.4.4.3 and 6.4.4.4 of NFPA 30B

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2.

a. The aggregate quantity in storage and retail display shall not exceed the quantity limits for retail display.

b. In any 50,000-square-foot area.

5106.5.7 Class I, II, III, IV and plastic commodities. Class I, II, III, IV and plastic commodities located adjacent to Level 2 and 3 aerosol products and plastic aerosol 3 products shall be protected in accordance with NFPA 13.

CHAPTER 53 COMPRESSED GASES

5306.1.1 Training. Personnel who handle medical gases and associated equipment and cylinders shall be trained on the use, safe handling and associated hazards.

[NY] 5306.2 Interior supply location. Medical gases shall be located in areas dedicated to the storage of such gases without other storage or uses. Rooms containing medical gases shall be labeled in accordance with NFPA 99. Where containers of medical gases in quantities greater than the permit amount listed in Table 5306.2 are located inside buildings, they shall be in a 1-hour exterior room, a 1-hour interior room or a gas cabinet in accordance with Section 5306.2.1, 5306.2.2 or 5306.2.3, respectively. Rooms or areas where medical gases are stored or used in quantities exceeding the *maximum allowable quantity* per control area as set forth in Section 5003.1 shall be in accordance with the *International Building Code* of New York State for high hazard Group H occupancies.

[NY] TABLE 5306.2 QUANTITIES OF COMPRESSED GASES REQUIRING CONTAINMENT

Type of Gas	Amount (cubic feet at NTP)
Carbon dioxide used in carbon dioxide enrichment systems	875 (100 lbs.)
Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications	875 (100 lbs.)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount

For SI: 1 cubic foot = 0.02832 m^3.

5306.2.2 One-hour interior room. Where an exterior wall cannot be provided for the room, a 1-hour interior room shall be provided and shall be a room or enclosure separated from the remainder of the building by fire barriers constructed in accordance with Section 707 of the International Building Code or horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both, with a fire-resistance rating of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be provided with self-closing, smoke- and draft-control assemblies having a fire protection rating of not less than 1 hour. An automatic sprinkler system shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. Approved mechanical ventilation shall comply with the International Mechanical Code and be provided at a minimum rate of 1 cfm per square foot [0.00508 $m^3/(s \cdot m^2)$] of the area of the room.

5306.5 Medical gas systems and equipment. Medical gas systems ~~including, but not limited to, distribution piping, supply manifolds, connections, pressure regulators and relief devices and valves~~ and equipment, shall be installed, tested and *labeled* in accordance with NFPA 99 and the general provisions of this chapter. Existing medical gas systems and equipment shall be used and maintained in accordance with the use, maintenance, inspection and testing provisions of NFPA 99 for medical gas systems and equipment.

5306.5.1 Medical gas cylinders. Operation and management of medical gas cylinders shall be in accordance with NFPA 99.

5307.3.2 Gas detection system. Where ventilation is not provided in accordance with Section 5307.3.1, a gas detection system complying with Section 916 shall be provided in rooms or indoor areas and in below-grade outdoor locations with insulated carbon dioxide systems. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is expected to accumulate or other approved locations. The system shall be designed as follows:

1. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m^3).
2. Activates an audible and visible alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m^3).

CHAPTER 56 EXPLOSIVES AND FIREWORKS

5601.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

1. Storage and handling of fireworks as allowed in Section 5604.
2. Manufacture, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with the 2006 edition of NFPA 1124, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100–185, as applicable for consumer fireworks.

[NY] 5601.2.4.2 Fireworks display. The permit holder shall furnish a bond o indemnity insurance policy in ~~an amount~~ accordance with New York Penal Law Section 405.00 and deemed adequate by the *fire code official* for the payment of all potential damages to a person or persons or to property by reason of the permitted display, and arising from any acts of the permit holder, the agent, employees or subcontractors

5604.6.5 Signs and placards. Property on which Type 1 magazines and outdoor magazines of Types 2, 4 and 5 are located shall be posted with signs stating: "NO SMOKING" and "EXPLOSIVES—KEEP OFF." These signs shall be

of contrasting colors with a minimum letter height of 3 inches (76 mm) with a minimum brush stroke of ½ inch (12.7 mm). The signs shall be located to minimize the possibility of a bullet shot at the sign hitting the magazine.

5606.1 General. Indoor storage and display of black powder, smokeless propellants, small arms primers, ~~and~~ small arms ammunition, and commercial reloading shall comply with this section and NFPA 495.

5606.6 Commercial Reloading. Commercial reloading of small arms ammunition shall comply with Sections 5606.6.1 through 5606.6.8.

5606.6.1 Electrical. Areas within 3 feet of reloading equipment shall be Class I, Division 2, Group A type.

5606.6.2 Exhaust Fans. Squirrel cage blowers shall not be used for exhausting hazardous fumes, vapors or gases. Only nonferrous fan blades shall be used for fans located within the ductwork and through which hazardous materials are exhausted. Motors shall be located outside the duct.

5606.6.3 Workstations. Workstations shall be separated by distance, barrier or other *approved* alternatives so that fire in one station will not ignite material in another workstation.

5606.6.4 Personnel Limits. The number of occupants in each process building and in each magazine shall not exceed the number necessary for proper conduct of production operations.

5606.6.5 Approved Containers. Smokeless powder shall be kept in its original container.

5606.6.6 Static Controls. The work area shall be provided with *approved* static controls.

5606.6.7 Waste Disposal. *Approved* receptacles with covers shall be provided for each location for disposing of waste material and debris. These waste receptacles shall be emptied and cleaned as often as necessary but not less than once each day or at the end of each shift.

5606.6.8 Safety Rules. General safety rules and operating instructions governing the particular operation or process conducted at that location shall be available at each location.

[NY] 5610.6.2 Reference standard requirements. Retail sales of sparkling devices shall comply with the applicable requirements of the 2006 edition of NFPA 1124.

[NY] 5610.7 Storage of sparkling devices. The storage or temporary storage of sparkling devices shall comply with the applicable requirements of the 2006 edition of NFPA 1124 and, in addition, shall be subject to the provisions of Section 5610.8.

[NY] 5610.10.1 Reference standard requirements. The manufacture, assembly, and testing of sparkling devices, and facilities where the manufacture, assembly and/or testing of sparkling device occur, shall comply with the requirements of this subdivision and NFPA 495 or the 2006 edition of NFPA 1124.

CHAPTER 57 FLAMMABLE AND COMBUSTIBLE LIQUIDS

5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including:

1.Specific provisions for Flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.

2.Medicines, foodstuffs, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).

3.Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, providied that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).

4.Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 603. For abandonment of fuel oil tanks, this chapter applies.

5.~~Refrigerant liquids and oils in r~~Refrigeration systems (see Section 605).

6.Storage and display of aerosol products complying with Chapter 51.

7.Storage and use of liquids that do not have a fire point when tested in accordance with ASTM D92.

8.Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.

9.Liquids without flash points that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.

10.The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.

11.Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 608 and NFPA 30.

12.Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturer's instructions and label directions.

13.The off-site transportation of *flammable* or *combustible liquids* where in accordance with Department of Transportation (DOTn) regulation.

TABLE 5703.6.2 PIPING STANDARDS

PIPING USE	STANDARD
Power piping	ASME B31.1
Process piping	ASME B31.3
Pipeline transportation systems for liquid hydrocarbons and other liquids	ASME B31.4
Building services piping	ASME B31.9
Double containment piping	UL 971A, UL 1369

5704.2.9.6.1 Locations where above-ground tanks are prohibited. Storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited within the limits established by ~~law as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction.

5704.2.9.7.5.1 Information signs. A permanent sign shall be provided at the fill point for the tank, documenting the filling procedure and the tank calibration chart.

Exception: Where climatic conditions are such that the sign ~~may be~~ has the potential to be obscured by ice or snow, or weathered beyond readability or otherwise impaired, said procedures and chart shall be located in the office window, lock box or other area available to the person filling the tank.

5704.2.11.4.2.1 Location. The leak detection panel status shall be annunciated at an *approved* on-site location.

[NY] 5704.2.13.1.4 Tanks abandoned in place. ~~Tanks abandoned in place shall be as follows~~: The abandoning of underground tanks in place shall comply with all of the following:

1. ~~Flammable and combustible liquids shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, and tank purged of all vapor. The contents of the storage tank and related piping shall be removed from the premises or property and disposed of in accordance with applicable local, state, or federal rules and regulations.

2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected and either be permanently removed, capped, plugged, or filled completely with an approved inert solid material.

3. Underground tanks shall be filled completely with an approved inert solid material.. ~~The tank shall be filled completely with an approved inert solid material.~~

4. Remaining underground piping shall be capped or plugged.

Exception: Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where approved by the fire code official.

5. A record of tank size, location and date of abandonment shall be retained.

6. All exterior above-grade fill piping shall be permanently removed when tanks are abandoned or removed, or the fill pipe shall be filled completely with an approved inert solid material.

7. The owner of tanks with automatic delivery shall notify the supplier or suppliers in writing a minimum of 24 hours prior to the abandonment, instructing them to discontinue deliveries.

5704.2.13.1.5 Reinstallation of underground tanks. Tanks that are to be reinstalled for flammable or combustible liquid service shall be in accordance with this chapter, *ASME Boiler and Pressure Vessel Code* (Section VIII), ~~API 12-P,~~ API 1615, UL 58 and UL 1316.

[NY] 5704.2.14.1 Removal. Removal of above-ground and underground tanks shall comply ~~be in accordance~~ with all of the following:

1. ~~Flammable and combustible liquids shall be removed from the tank and connected piping.~~ The entire contents of the tank and related piping shall be emptied, cleaned, purged of all vapor, and inerted.

2. Piping at tank openings that is not to be used further shall be disconnected.

3. Piping shall be removed from the ground.

~~Exception~~ Exceptions:

1. Piping is allowed to be abandoned in place where the *fire code official* determines that removal is not practical. Abandoned piping shall be capped and safeguarded as required by the *fire code official*.

2. Piping that is reused for the installation of a new tank and meets the applicable requirements for the new installation shall be allowed to remain where approved by the *fire code official*.

4. Tank openings shall be capped or plugged, leaving a $^{1}/_{8}$ -inch to $^{1}/_{4}$ -inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.

5. Tanks shall be purged of vapor and inerted prior to removal.

6. All exterior above-grade fill and vent piping shall either be permanently removed or filled completely with an *approved* inert solid material.

Exception: Piping associated with bulk plants, terminal facilities and refineries.

7. The *owner* of tanks with automatic delivery shall have the supplier or suppliers notified in writing a minimum of 24 hours prior to the removal, instructing them to discontinue deliveries.

[NY] 5704.2.14.2 Disposal. ~~Tanks shall be disposed of in accordance with federal, state and local regulations.~~ The tank and related piping, and the contents of the tank and related piping shall be removed from the premises and disposed of in accordance with applicable local, state, or federal rules and regulations

5704.3.5.1 Basement storage. Class I liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity per control area for use-open systems in Table 5003.1.1(1), provided that ~~automatic suppression and other~~ fire protection systems are provided in accordance with Chapter 9. Class II and IIIA liquids shall be allowed to be stored in basements, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

5704.3.7.5.1 Fire ~~extinguishing~~ protection systems. Liquid storage rooms shall be protected by automatic sprinkler systems installed in accordance with Chapter 9 and Tables 5704.3.6.3(4) through 5704.3.6.3(7) and Table 5704.3.7.5.1. In-rack sprinklers shall also comply with NFPA 13.

Automatic foam-water systems and automatic aqueous film-forming foam (AFFF) water sprinkler systems shall not be used except where approved.

Protection criteria developed from fire modeling or full-scale fire testing conducted at an approved testing laboratory are allowed in lieu of the protection as shown in Tables 5704.3.6.3(2) through 5704.3.6.3(7) and Table 5704.3.7.5.1 where approved.

5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of ~~wall-mounted~~ dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. ~~The d~~ Dispensers shall not be ~~installed~~ located above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening counter top shall be free of electrical receptacles, switches, appliances, devices or other ignition sources.
4. Dispensers shall be ~~mounted~~ located so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor.
5. Dispensers shall not obstruct required means of egress or be placed within 3 feet (914 mm) of an open flame, heating device or other ignition source.

~~5~~ 6. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "touch free" alcohol-based hand-rub dispensing devices with the following requirements:

~~5~~6.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions.

~~5~~6.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:

~~5~~ 6.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device.

~~5~~ 6.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the United States Food and Drug Administration (USFDA).

~~5~~ 6.2.3. An object placed within the activation zone and left in place will cause only one activation.

~~6~~ 7. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705.

~~7~~ 8. Dispensers ~~installed~~ located in occupancies with carpeted floors shall only be allowed in smoke compartments or fire areas equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

5705.5.1 Corridor installations. In addition to the provisions of Section 5705.5, where ~~wall-mounted~~ dispensers containing alcohol-based hand rubs are ~~installed~~ located in *corridors* or rooms and areas open to the *corridor*, they shall be in accordance with all of the following:

1. Level 2 and 3 aerosol containers shall not be allowed in *corridors*.
2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg).
3. The maximum quantity allowed in a *corridor* within a *control area* shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one.
4. The minimum *corridor* width shall be 72 inches (1829 mm).
5. Projections into a *corridor* shall be in accordance with Section 1003.3.3.

5706.2.4.4 Locations where above-ground tanks are prohibited. The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction.

5706.5 Bulk transfer and process transfer operations. Bulk transfer and process transfer operations shall be *approved* and be in accordance with Sections 5706.5.1 through 5706.5.3.3 ~~5706.5.4.5~~. Motor fuel-dispensing facilities shall comply with Chapter 23.

5706.5.4 Dispensing from tank vehicles and tank cars. Dispensing from tank cars into the fuel tanks of motor vehicles shall be prohibited. Dispensing from tank vehicles ~~and tank cars~~ into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5.

5706.5.4.1 Marine craft and special equipment. Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment where *approved* by the *fire code official*, and where:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.
3. The dispensing line does not exceed 50 feet (15 240 mm) in length.
4. The dispensing nozzle is *approved*.
5. The operation shall be in accordance with Sections 2310.4.1 and 2310.4.2.

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where *approved* ~~permitted~~, provided that such dispensing operations are conducted in accordance with the following:I…

The remainder of this section remains unchanged.

[NY] SECTION 5707 RESERVED

CHAPTER 58 FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS

5806.2 Limitations. Storage of flammable *cryogenic fluids* in stationary containers outside of buildings is prohibited within the limits established by law ~~as the limits of districts in which such storage is prohibited [JURISDICTION TO SPECIFY]~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction.

[NY] 5809 Reserved

CHAPTER 61 LIQUEFIED PETROLEUM GASES

6103.2.1.1 Use in basement, pit or similar location. LP-gas containers shall not be used in a basement, pit, above-grade underfloor space or similar location where heavier-than-air gas might ~~collect. LP-gas containers shall not be used in an above-grade underfloor space or basement~~ collect unless such location is provided with an approved means of ventilation.

Exception: Use with self-contained torch assemblies in accordance with Section 6103.2.1.6

~~[NY]~~ **6104.2 Maximum capacity within established limits.** For the protection of heavily populated or congested areas, storage of liquified petroleum gas shall not exceed an aggregate capacity in any one installation of 2,000 gallons (7570 L) within the limits established by law ~~restricting the storage of liquefied petroleum gas for the protection of~~

~~heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L)~~ as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction.

Exception: In particular installations, this capacity limit shall be determined by the fire code official, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.

TABLE 6109.12 SEPARATION FROM EXPOSURES OF LP-GAS CONTAINERS AWAITING USE, RESALE OR EXCHANGE STORED OUTSIDE OF BUILDINGS

QUANTITY OF LP GAS STORED (pounds)	MINIMUM SEPARATION DISTANCE FROM STORED LP-GAS CYLINDERS TO (feet):						
	Nearest important building or group of buildings or line of adjoining property that ~~may be~~ has the potential to be built on	Line of adjoining property occupied by schools, places of religious worship, hospitals, athletic fields or other points of public gathering; busy thoroughfares; or sidewalks	LP-gas dispensing station	Doorway or opening to a building with two or more means of egress	Doorway or opening to a building with one means of egress	Combustible materials	Motor vehicle fuel dispenser
720 or less	0	0	5	5	10	10	20
721–2,500	0	10	10	5	10	10	20
2,501–6,000	10	10	10	10	10	10	20
6,001–10,000	20	20	20	20	20	10	20
Over 10,000	25	25	25	25	25	10	20

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.

6110.1 ~~Temporarily out of~~ Removed from service. LP-gas containers whose use has been ~~temporarily~~ discontinued shall comply with all of the following:

1. 1.Be disconnected from appliance piping.
2. 2.Have LP-gas container outlets, except relief valves, closed or plugged.
3. 3.Be positioned with the relief valve in direct communication with the LP-gas container vapor space.

6110.2 ~~Permanently out of service.~~ Removal from site. LP-gas containers ~~to be placed permanently out of~~ discontinued from service shall be removed from the site.

CHAPTER 63 OXIDIZERS, OXIDIZING GASES AND OXIDIZING CRYOGENIC FLUIDS

~~6303.2~~ 6303.1.4 **Class 1, 2 and 3 oxidizer storage configuration.** The storage configuration of Class 1, 2 and 3 liquid and solid oxidizers shall be as set forth in Table ~~6303.2.~~ 6303.1.4.

TABLE ~~6303.2~~ 6303.1.4 STORAGE OF CLASS 1, 2 and 3 OXIDIZER LIQUIDS AND SOLIDS

STORAGE CONFIGURATION	LIMITS (feet)		
	Class 1	Class 2	Class 3
Piles			
Maximum width	24	16	12
Maximum height	20	Note c	Note c
Maximum distance to aisle	12	8	8
Minimum distance to next pile	4[a]	Note a	Note a
Minimum distance to walls	2[b]	2	4
Maximum quantity per pile	200 tons	MAQ	NA
Maximum quantity per building	No Limit	Note d	Note d

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 ton = 0.907185 metric ton.

MAQ = Maximum Allowable Quantity.

NA = Not Applicable.

a. The minimum aisle width shall be equal to the pile height, but not less than 4 feet and not greater than 8 feet.

b. There shall not be a minimum distance from the pile to a wall for amounts less than 9,000 pounds.

c. Maximum storage height in nonsprinklered buildings is limited to 6 feet. In sprinklered buildings see NFPA 400 for storage heights based on ceiling sprinkler protection.

d. Maximum quantity per building varies. See Chapter 50 for control areas and MAQs.

~~6303.1.1.2~~ 6303.1.5 **Class 3 liquid and solid oxidizers.** Not more than 220 pounds (99 kg) of solid or 22 gallons (83 L) of liquid Class 3 oxidizer is allowed in storage and use where such materials are necessary for maintenance purposes or operation of equipment. The oxidizers shall be stored in approved containers and in an approved manner.

TABLE 6304.1.5(1) STORAGE OF CLASS 2 OXIDIZER LIQUIDS AND SOLIDS

STORAGE CONFIGURATION	LIMITS		
	~~Control area storage~~	Group H occupancy storage	Detached storage
Piles			
Maximum width	~~16 feet~~	25 feet	25 feet
Maximum height	~~Note a~~	Note a	Note a

Maximum distance to aisle	~~8 feet~~	12 feet	12 feet
Minimum distance to next pile	~~Note b~~	Note b	Note b
Minimum distance to walls	~~2 feet~~	2 feet[c]	2 feet[c]
Maximum quantity per pile	~~MAQ~~	100 tons	100 tons
Maximum quantity per building	~~MAQ~~	2000 tons	No Limit

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 ton = 0.907185 metric ton.

a. Maximum storage height in nonsprinklered buidlings is limited to 6 feet. In sprinklered buildings see NFPA 400 for storage heights based on ceiling sprinkler protection.

b. The minimum aisle width shall be equal to the pile height, but not less than 4 feet and not greater than 8 feet.

c. For protection level and detached storage under 4,500 pounds, there shall not be a minimum separation distance between the pile and any wall.

TABLE 6304.1.5(2) STORAGE OF CLASS 3 OXIDIZER LIQUIDS AND SOLIDS

STORAGE CONFIGURATION	**LIMITS**		
	~~Control area~~ ~~storage~~	**Group H occupancy storage**	**Detached storage**
Piles			
Maximum width	~~12 feet~~	16 feet	20 feet
Maximum height	~~Note a~~	Note a	Note a
Maximum distance to aisle	~~8 feet~~	10 feet	10 feet
Minimum distance to next pile	~~Note b~~	Note b	Note b
Minimum distance to walls	~~4 feet~~	4 feet[c]	4 feet[c]
Maximum quantity per pile	~~NA~~	30 tons	100 tons
Maximum quantity per building	~~MAQ~~	1200 tons	No Limit

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 ton = 0.907185 metric ton.

a. Maximum storage height in nonsprinklered buildings is limited to 6 feet. In sprinklered buildings see NFPA 400 for storage heights based on ceiling sprinkler protection.

b. The minimum aisle width shall be equal to the pile height, but not less than 4 feet and not greater than 8 feet.

c. For protection level and detached storage under 2,300 pounds, there shall not be a minimum separation distance between the pile and any wall.

CHAPTER 80: REFERENCE STANDARDS

ANSI

ANSI Z21.58/CSA 1.6-2015: Outdoor Cooking Gas Appliances

API

~~Spec 12P – 3rd Edition (Reaffirmed 2008): Specification for Fiberglass Reinforced Plastic Tanks~~

ASTM

ASTM E3082-20 Standard Test Methods for Determining the Effectiveness of Fire-Retardant Treatments for Natural Christmas Trees

ASTM F2374-19: Standard Practice For Design, Manufacture, Operation, And Maintenance Of Inflatable Amusement Devices

CSA

ANSI Z83.26/CSA 2.37-2014: Gas-Fired Outdoor Infrared Patio Heaters

CSA/ANSI NGV 5.2—2022: Vehicle Fueling Appliances (VFA)

CSA/ANSI NGV 5.1-2022: Residential Fueling Appliances

DOTn

49 CFR Part 173.192—2006: Packaging for Certain Toxic Gases in Hazard Zone A

49 CFR Part 178—2015: Specifications for Packagings

49 CFR Parts 100–185—2015: Hazardous Materials Regulations

ICC

~~IWUIC – 18: International Wildland-Urban Interface Code~~

IIAR (International Institute of Ammonia)

ANSI/IIAR CO2-2021: Safety Standard for Closed-Circuit Carbon Dioxide Refrigeration Systems

~~IIAR-2 – 2014~~ IIAR 2—2021: Safe Design of Closed-circuit Ammonia ~~Refrigerating~~ Refrigeration Systems

~~IIAR-7 – 2013~~ IIAR 7—2019: Developing Operating Procedures for Closed-circuit Ammonia Mechanical ~~Refrigerating~~ Refrigeration Systems

~~IIAR-8 – 2015~~ IIAR 8—2020 Decommissioning of Closed-circuit Ammonia ~~Refrigerating~~ Refrigeration Systems

IIAR 9-2018: Standard for Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for Existing Closed-circuit Ammonia Refrigeration Systems

NFPA

68—23: Standard on Explosion Protection by Deflagration Venting

77-24: Recommended Practice on Static Electricity

~~720—15: Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment~~

770-2021 Standard on Hybrid (Water and Inert Gas) Fire Extinguishing Systems

780-23 Standard f or the Installation of Lightning Protection Systems

~~1221—19: Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems~~

1225-2021: Standards for Emergency Services Communications

UL

10C—2016: Positive Pressure Fire Tests of Door Assemblies—with revisions through May 2021

142A-2018: Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids

443-06: Steel Auxiliary Tanks for Oil-Burner Fuel (with revisions through March 8, 2013)

498A-08: Current Taps and Adapters - with Revisions thru June 10, 2016

962A-2018: Furniture Power Distribution Units (with revisions through September 1, 2020)

1034-2011: Burglary-Resistant Electric Locking Mechanisms – with Revisions through June 2020

1778-2014: Uninterruptible Power Systems – With Revisions through October 2017

2011-06: Factory Automation Equipment

2201-18: Standard Carbon Monoxide (CO) Emission Rate of Portable Generators

2272-2016: Electrical Systems for Personal E-Mobility Devices

2524 -2019: Outline of Investigation for In-building 2-Way Emergency Radio Communication Enhancement Systems

2525-2020: STANDARD FOR Two-Way Emergency Communications Systems for Rescue Assistance

2849-2020: Electrical Systems for eBikes

3741-2020: Standard for Safety for Photovoltaic Hazard Control

ANSI/CAN/UL 8800-2019: Standard for Horticultural Lighting Equipment And Systems

60950-1—07: Information Technology Equipment - Safety Requirements - with revisions through May 2019

62368-1—19: Audio/video, Information and Communication Technology Equipment - Safety Requirements - with revisions through October 2021

Appendix B

B104.1 General. The *fire-flow calculation area* shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building~~, except as modified in Section B104.3~~.

Exceptions:

1. The *fire-flow calculation area* of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.
2. *Fire-flow calculation area* for open parking garages of Type IA and IB construction shall be determined by the area of the largest floor.

B104.2 Area separation. Portions of buildings that are separated by *fire walls* without openings, constructed in accordance with the *International Building Code*, are allowed to be considered as separate *fire-flow calculation areas*.

~~**B104.3 Type IA and Type IB construction.** The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.~~

Exception: ~~Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.~~

Appendix D

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to~~be accessible to~~ fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing up to 75,000 pounds (34 050 kg).

D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1.Where a single gate is provided, the gate width shall be not less than 20 feet (6096 mm). Where a fire apparatus road consists of a divided roadway, the gate width shall be not less than 12 feet (3658 mm).

2.Gates shall be of the ~~swinging or sliding~~ horizontal swing, horizontal slide, vertical lift or vertical pivot type.

3.Construction of gates shall be of materials that allow manual operation by one person.

4.Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.

5.Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.

6.Methods of locking shall be submitted for approval by the fire code official.

7.Electric gate operators, where provided, shall be listed in accordance with UL 325.

8.Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200.

[NY] D105.1 Where required. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

Exception: Where approved by the fire code official, buildings of Type IA, Type IB, or Type IIA Construction, equipped throughout with an automatic sprinkler system in accordance to Section 903.3.1.1; and having firefighter access through an enclosed stairway with a Class I Standpipe, in conformance with NFPA 14, from the lowest level of fire department vehicle access to all roof surfaces.

[NY] D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads.

Exceptions:

1.Where there are more than 30 dwelling units ~~on~~ accessed from a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.

2.The number of dwelling units ~~on~~ accessed from a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the fire code official.

3. Construction of dwellings on premises which have had local site plan approval prior to January 1, 2011, with no modification to *approved* site plan.

Appendix E

E102.1.7.2 Oxidizer classification. The UN's *Globally Harmonized System (GHS)* is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials. Federal law (DOL 29 CFR 1910.1200 and DOTn 49 CFR 173.127) mandates that manufacturers selling, producing or transporting chemicals in the United States classify chemicals according to the GHS system and make the classifications available in product Safety Data Sheets. For the classification of solid and liquid *oxidizers*, GHS relies on relevant quantitative test data that measures burning rate, a key indicator of the severity of the hazard. To assist code officials, an alignment between the GHS and IFC *oxidizer* hazard classes is provided in Table E102.1.7.2. This alignment is provided as a tool to assist fire code officials and should not be used as the sole means for hazardous materials classification.

TABLE E102.1.7.2

Oxidizer comparison (IFC vs. GHS)

IFC Hazard Class	GHS Hazard Category
Oxidizer, Class 4	H271, Category 1
Oxidizer, Class 3	H271, Category 1
Oxidizer, Class 2	H272, Category 2
Oxidizer, Class 1	H272, Category 3

E103.1.5 Surrounding conditions. Conditions such as other materials or processes in the area, type of construction of the structure, fire protection features (for example, *fire walls*, *automatic sprinkler systems*, alarms), occupancy (use) of adjoining areas, normal temperatures, exposure to weather, etc., must be taken into account in evaluating the hazard.

SECTION E104 GHS HAZARDOUS MATERIALS DEFINITIONS CONTENT.

E104.1 Hazardous materials definitions. The categorization and classification of hazardous materials enables the code user to determine the applicability of requirements based on hazard category and class related to the physical and health hazards of materials. The current definitions found in Chapter 2 have been developed using criteria found in NFPA codes and standards, model fire prevention codes, NIOSH, and requirements of the US Department of Transportation (DOTn 49 CFR), and by US Department of Labor (DOL 49 CFR 1910).

The chemical industry has grown substantially since the inception of the IFC hazard definitions. Large-scale global production and distribution of common and specialty chemicals has become mainstream. In the 1990s, the United Nations (UN) developed *the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)* to create international congruency among chemical suppliers. The GHS is an internationally agreed upon standard of classification and labeling that utilizes prescriptive, standardized testing procedures and criteria to classify hazardous materials.

The DOL published a revised *Hazard Communication Standard* (DOL 29 CFR 1910.1200) to align with the GHS in March 2012. It became effective in May 2012. All manufacturers selling, producing or transporting chemicals in the United States are now required to comply with the GHS and provide this standardized hazard information on all Safety Data Sheets (SDS).

SDS are a primary source of information for identifying hazards for chemicals and mixtures containing hazardous materials. It can be helpful for fire code officials to become familiar with the GHS definitions and how they relate to IFC hazard definitions.

E104.2 GHS Hazardous Materials Definitions Comparison Table. Table E104.2 provides a tabular presentation of the various definitions published within the *International Fire Code*. In addition, the table presents corresponding definitions, where available, from the 2012 edition of DOL 29 CFR 1910.1200) along with applicable hazard statement codes. DOL 29 CFR 1910.1200 aligns with the UN's *Globally Harmonized System of Classification and Labeling of Chemicals (GHS)*. The Table is not meant to imply perfect alignment between IFC and GHS definitions.

TABLE E104.2 IFC AND GHS HAZARD DEFINITION COMPARISON

IFC MATERIAL	IFC CLASS	IFC DEFINITION	GHS 2017 (REV 7) CLASSIFICATION (H-CODE AND CATEGORY); HAZARD STATEMENT; DEFINITION
Aerosol	-	A combination of a container, a propellant and a material that is dispensed. Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.	Any non-refillable receptacles made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state
Aerosol	Level 1	Those with a total chemical heat of combustion that is less than or equal to 8,600 Btu/lb (20kJ/g).	H223, Category 3; Pressurized container: May burst if heated. 1. Any aerosol that contains ≤ 1% flammable components (by mass) and that has a heat of combustion < 20 kJ/g. 2. 2. Any aerosol that contains > 1% (by mass) flammable components or which has a heat of combustion of ≥ 20 kJ/g but which, based on the results of the ignition distance test, the enclosed space ignition test or the aerosol foam flammability test, does not meet the criteria for Category 1 or Category 2.
Aerosol	Level 2	Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20kJ/g), but less than or equal to 13,000 Btu/lb (30kJ/g).	H223, Category 2; Flammable aerosol. Pressurized container: May burst if heated: 1. Any aerosol that dispenses a spray that, based on the results of the ignition distance test, does not meet the criteria for Category 1, and which has: a. A heat of combustion of >= 20 kJ/g b. A heat of combustion of < 20 kJ/g along with an ignition distance of >= 15 cm; or c. A heat of combustion of < 20 kJ/g and an ignition distance of < 15 cm along with either, in the enclosed space ignition test a time: i. A time equivalent of ≤ 300 s/m3. ii. A deflagration density of ≤ 300 g/m3; or 2. Any aerosol that dispenses a foam that, based on the results of the aerosol foam flammability test, does not meet the criteria for Category 1, and which has a flame height of ≥ 4 cm and a flame duration of ≥ 2 s.
Aerosol	Level 3	Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30kJ/g).	H222, Category 1; Extremely flammable aerosol. Pressurized container: May burst if heated: 1. Any aerosol that contains >= 85% flammable components (by mass) and has a heat of combustion of >= 30 kJ/g; 2. Any aerosol that dispenses a spray that, in the ignition distance test, has an ignition distance of >= 75 cm; or 3. Any aerosol that dispenses a foam that, in the foam flammability test, has: a. a flame height of >= 20 cm and a flame duration of >= 2 s; or

			b. a flame height of >= 4 cm and a flame duration of >= 7 s.
Combustible liquid	-	A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:	A flammable liquid means a liquid having a flash point of not more than 93°C
Combustible liquid	II	Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).	H226, Category 3; Flammable liquid and vapor: Flash point ≥ 23°C and ≤ 60°C
Combustible Liquid	IIIA	Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C)	H227, Category 4; Combustible liquid Flash point > 60°C and ≤ 93°C
Combustible Liquid	IIIB	Liquids having closed cup flash points at or above 200°F (93°C).	N/A
Compressed Gas	-	A material or mixture of materials that: 1. Is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure, and 2. Has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa) which is either liquefied, nonliquefied or in solution, except those gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia (282 kPa) at 68°F (20°C). States of compressed gases: 1. Nonliquefied compressed gases are gases, other than those in solution, which are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68°F (20°C). 2. Liquefied compressed gases are gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68°F (20°C). 3. Compressed gases in solution are nonliquefied gases that are dissolved in a solvent. 4. Compressed gas mixtures consist of a mixture of two or more compressed gases contained in a packaging, the hazard properties of which are represented by the properties of the mixture as a whole.	Gases under pressure are gases which are contained in a receptacle at a pressure of 200 kPa (gauge) or more at 20°C, or which are liquefied, or liquefied and refrigerated. H280, compressed gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature ≤ -50°C (-58°F). H280, liquefied gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is partially liquid at temperatures above -50°C (-58°F). H280, dissolved gas; Contains gas under pressure; May explode if heated: A gas which when under pressure is dissolved in a liquid phase solvent.

Corrosive	-	A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. A chemical shall be considered corrosive if, when tested on the intact skin of albino rabbits by the method described in DOTn 49 CFR 173.137, such chemical destroys or changes irreversibly the structure of the tissue at the point of contact following an exposure period of 4 hours. This term does not refer to action on inanimate surfaces.	H314, Category 1 (1A, 1B, 1C); Causes severe skin burns and eye damage: Skin corrosion refers to the production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.
Cryogenic fluid	-	A fluid having a boiling point lower than -130°F (- 89.9°C) at 14.7 pounds per square inch atmosphere (psia) (an absolute pressure of 101.3 kPa)	H281, refrigerated liquefied gas; Contains refrigerated gas; May cause cryogenic burns or injury: A gas which is made partially liquid because of its low temperature.
Cryogenic - Flammable	-	A cryogenic fluid that is flammable in its vapor state.	H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: 1. Are ignitable when in a mixture of 13% or less by volume in air; or 2. Have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B Category 1A includes Pyrophoric gases and chemically unstable gases. H281, refrigerated liquefied gas would also apply.
Cryogenic - Inert	-	A cryogenic fluid that is inert.	H281, refrigerated liquefied gas; Contains refrigerated gas: May cause cryogenic burns or injury. A gas which is made partially liquid because of its low temperature.
Cryogenic - Oxidizing	-	An oxidizing gas in the cryogenic state.	H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H281, refrigerated liquefied gas would also apply
Explosives	-	A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord and igniters. The term “Explosive” includes any material determined to be within the scope of USC Title 18: Ch. 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G by the hazardous materials regulations of DOTn CFR Parts 100-185.	An explosive substance (or mixture) is a solid or liquid substance (or mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.
Explosives	Unstable Explosives		H200; Unstable Explosive: Unstable explosives are those which are thermally unstable and/or too sensitive for normal handling, transport and use. Special precautions are necessary.

Explosives	Division 1.1	Explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.	H201; Explosive; mass explosion hazard: Substances, mixtures and articles which have a mass explosion hazard (a mass explosion is one which affects almost the entire quantity present virtually instantaneously).
Explosives	Division 1.2	Explosives that have a projection hazard but not a mass explosion hazard.	H202; Explosive; severe projection hazard: Substances, mixtures and articles which have a projection hazard but not a mass explosion hazard.
Explosives	Division 1.3	Explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.	H203; Explosive; fire, blast or projection hazard: Substances, mixtures, and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard: 1. Combustion of which gives rise to considerable radiant heat; or 2. Which burn one after another, producing minor blast or projection effects or both.
Explosives	Division 1.4	Explosives that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.	H204; Fire or projection hazard: Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.
Explosives	Division 1.4G	Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visual or audible effects by combustion or deflagration that complies with the construction, chemical composition and labeling regulations of the DOTn for fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR Parts 1500 and 1507.	N/A
Explosives	Division 1.5	Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.	H205; May mass explode in fire: Very insensitive substances or mixtures which have a mass explosion hazard: substances and mixtures which have a mass explosion hazard but are so insensitive that there is very little probability or initiation or of transition from burning to detonation under normal conditions.
Explosives	Division 1.6	Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.	Extremely insensitive articles which do not have a mass explosion hazard: articles which predominantly contain extremely insensitive substances or mixtures and which demonstrate a negligible probability of accidental initiation or propagation.

Flammable Gas	Gaseous	A material which is a gas at 68°F (20°C) or less at 14.7 psia (101 kPa) of pressure [a material that has a boiling point of 68°F (20°C) or less at 14.7 psia (101 kPa)] which: 1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13% or less by volume with air; or 2. Has a flammable range at 14.7 psia (101 kPa) with air of not less than 12%, regardless of the lower limit. The limits specified shall be determined at 14.7 psia (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: 1. Are ignitable when in a mixture of 13% or less by volume in air; or 2. Have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B. Category 1A includes Pyrophoric gases and chemically unstable gases. H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: 1. A lower flammability limit of more than 6% by volume in air; or 2. A fundamental burning velocity of less than 10 cm/s. H280, compressed gas would also apply.
Flammable Gas	Liquified	A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is flammable.	A flammable gas is a gas having a flammable range with air at 20°C and a standard pressure of 101.3kPa H220, Category 1A; Extremely flammable gas: Gases, which at 20°C and a standard pressure of 101.3 kPa: 1. Are ignitable when in a mixture of 13% or less by volume in air; or 2. Have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit unless data show they meet the criteria for Category 1B. Category 1A includes pyrophoric gases and chemically unstable gases H220, Category 1B; Flammable gas: Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: 1. A lower flammability limit of more than 6% by volume in air; or 2. A fundamental burning velocity of less than 10 cm/s AND 1. A gas which when packaged under pressure, is partially liquid at temperatures above -50°C. A distinction is made between: 2. High pressure liquefied gas: a gas with a critical temperature between -50°C and +65°C and Low pressure liquefied gas: a gas with a critical temperature above +65°C. Refrigerated liquified gas A gas which when packaged is made partially liquid because of its low temperature.

			Dissolved gas: A gas which when packaged under pressure is dissolved in a liquid phase solvent. H280, liquefied gas would also apply.
Flammable Liquid	-	A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows	A liquid having a flash point of not more than 93°C. A flammable liquid is classified in one of the four categories for this class.
Flammable Liquid	IA	Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).	H224, Category 1; Extremely flammable liquid and vapor: Flash point < 23°C and initial boiling point <= 35°C
Flammable Liquid	IB	Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).	H225, Category 2; Highly flammable liquid and vapor. Flash point < 23°C and initial boiling point > 35°C
Flammable Liquid	IC	Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).	H226, Category 3; Flammable liquid and vapor. Flash point >= 23°C and <= 60°C
Flammable Solid	-	A solid, other than a blasting agent or explosive, that is capable of causing fire through friction, absorption of moisture, spontaneous chemical change or retaining heat from manufacturing or processing, or which has an ignition temperature below 212°F (100°C) or which burns so vigorously and persistently when ignited as to create a serious hazard. A chemical shall be considered a flammable solid as determined in accordance with the test method of CPSC 16 CFR Part 1500.44, if it ignites and burns with a self-sustained flame at a rate greater than 0.0866 inch (2.2 mm) per second along its major axis.	A flammable solid is a solid which is readily combustible or may cause or contribute to fire through friction. A flammable solid is classified in one of the two categories for this class using method N.1 as described in Part III, sub-section 33.2.1 of the Manual of Tests and Criteria, according to: H228, Category 1; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: 1. Wetted zone does not stop fire; and 2. Burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time <=5 min. H228, Category 2; Flammable solid: Burning rate test: Substances or mixtures other than metal powders: 1. Wetted zone stops the fire for at least 4 min; and 2. Burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time > 5 min and <= 10 min.

Highly Toxic	-	A material which produces a lethal dose or lethal concentration which falls within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of 200 mg or less per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of 200 ppm by volume or less of gas or vapor, or 2 mg/l or less of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g.	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. Oral: H300, Category 1; Fatal if swallowed: LD50 ≤ 5 mg/kg bodyweight H300, Category 2; Fatal if swallowed: LD50 > 5 ≤ 50 mg/kg bodyweight Dermal: H310, Category 1; Fatal in contact with skin: LD50 ≤ 50 mg/kg bodyweight H310, Category 2; Fatal in contact with skin: LD50 > 50 ≤ 200 mg/kg bodyweight Inhalation: H330, Category 1; Fatal if inhaled: Gases: LC50 ≤ 100 ppm (4 hr) ≈ 200 ppm (1 hr) Vapors: LC50 ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) Dust/mist: LC50 ≤ 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr)
Inert Gas	-	A gas that is capable of reacting with other materials only under abnormal conditions such as high temperatures, pressures and similar extrinsic physical forces. Within the context of the code, inert gases do not exhibit either physical or health hazard properties as defined (other than acting as a simple asphyxiant) or hazard properties other than those of a compressed gas. Some of the more common inert gases include argon, helium, krypton, neon, nitrogen, and xenon.	Gases under pressure are gases which are contained in receptacles at a pressure of 200 kPa (gauge) or more at 20°C or which are liquefied or liquefied and refrigerated. They comprise compressed gases, liquefied gases, dissolved gases, and refrigerated liquefied gases. See the description of “compressed gas.”
Organic Peroxide	-	An organic compound that contains the bivalent -O- O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms have been replaced by an organic radical. Organic peroxides can present an explosion hazard (detonation or deflagration) or they can be shock sensitive. They can also decompose into various unstable compounds over an extended period of time.	Organic peroxides are liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term also includes organic peroxide formulations (mixtures). Organic peroxides are thermally unstable substances or mixtures, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties: 1. Be liable to explosive decomposition; 2. Burn rapidly; 3. Be sensitive to impact or friction; 4. React dangerously with other substances.
Organic peroxide	UD	Organic peroxides that are capable of detonation. These peroxides pose an extremely high-explosion hazard through rapid explosive decomposition.	H240, Organic Peroxide, Type A; Heating may cause an explosion: Any organic peroxide which, as packaged, can detonate or deflagrate rapidly will be defined as organic peroxide TYPE A.

Organic Peroxide	I	Describes those formulations that are capable of deflagration but not detonation.	H241, Organic Peroxide, Type B; Heating may cause a fire or explosion: Any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as organic peroxide TYPE B;
Organic Peroxide	II	Describes those formulations that burn very rapidly and that pose a moderate reactivity hazard.	H242, Organic Peroxide, Type C; Heating may cause a fire: Any organic peroxide possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as organic peroxide TYPE C; H242, Organic Peroxide, Type D; Heating may cause a fire: Any organic peroxide which in laboratory testing: Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or Does not detonate or deflagrate at all and shows a medium effect when heated under confinement; will be defined as organic peroxide TYPE D;
Organic Peroxide	III	Describes those formulations that burn rapidly and that pose a moderate reactivity hazard.	H242, Organic Peroxide, Type E; Heating may cause a fire: Any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as organic peroxide TYPE E.
Organic Peroxide	IV	Describes those formulations that burn in the same manner as ordinary combustibles and that pose a minimal reactivity hazard.	H242, Organic Peroxide, Type F; Heating may cause a fire: Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as organic peroxide TYPE F.
Organic peroxide	V	Describes those formulations that burn with less intensity than ordinary combustibles or do not sustain combustion and that pose no reactivity hazard.	H240, Organic Peroxide, Type G; Heating may cause a fire: Any organic peroxide which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self-accelerating decomposition temperature is 60°C or higher for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point of not less than 150 °C is used for desensitization, will be defined as organic peroxide TYPE G. If the organic peroxide is not thermally stable or a diluent having a boiling point less than 150°C is used for desensitization, it shall be defined as organic peroxide TYPE F.

Oxidizer	-	A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition.	An oxidizing solid is a solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. An oxidizing liquid is a liquid which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.
Oxidizer	4	An oxidizer that can undergo an explosive reaction due to contamination or exposure to a thermal or physical shock that causes a severe increase in the burning rate of combustible materials with which it comes into contact. Additionally, the oxidizer causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.	H271, Category 1; May cause fire or explosion; strong oxidizer: Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.
Oxidizer	3	An oxidizer that causes a severe increase in the burning rate of combustible materials with which it comes in contact.	H271, Category 1; May cause fire or explosion; strong oxidizer: Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture (by mass) of potassium bromate and cellulose. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose.

Oxidizer	2	An oxidizer that will cause a moderate increase in the burning rate of combustible materials with which it comes in contact.	H272, Category 2; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Category 1 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose and the criteria for Category 1 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 40% aqueous sodium chlorate solution and cellulose; and the criteria for Category 1 are not met.
Oxidizer	1	An oxidizer that does not moderately increase the burning rate of combustible materials.	H272, Category 3; May intensify fire, oxidizer Criteria for solids (based on Test O.1 or O.3 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Test O.1—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Categories 1 and 2 are not met. Test O.3—Any substance or mixture which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose and the criteria for Categories 1 and 2 are not met. Criteria for liquids (based on Test O.2 in Part III of UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria): Any substance or mixture which, in the 1:1 mixture, by mass, of substance (or mixture) and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of a 65% aqueous nitric acid solution and cellulose; and the criteria for Categories 1 and 2 are not met.

Oxidizing gas	Gaseous	A gas that can support and accelerate combustion of other materials more than air does.	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, compressed gas would also apply
Oxidizing gas	Liquified	An oxidizing gas that is liquefied (liquefied gases are gases that, in a packaging under the charged pressure, are partially liquid at 68°F (20°C).	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H270, Category 1; May cause or intensify fire; oxidizer: Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. H280, liquefied gas would also apply
Pyrophoric		A chemical with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	Separate definitions based upon physical state, see each category of pyrophoric:
Pyrophoric	Solid	A solid with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	H250, Category 1; Pyrophoric solid, catches fire spontaneously if exposed to air: A pyrophoric solid is a solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The solid ignites within 5 min of coming into contact with air.
Pyrophoric	Liquid	A liquid with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	H250, Category 1; Pyrophoric liquid, catches fire spontaneously if exposed to air: A pyrophoric liquid is a liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air. Classification criteria: The liquid ignites within 5 min when added to an inert carrier and exposed to air, or it ignites or chars a filter paper on contact with air within 5 min. Testing is performed at 25 ±2°C and 50 ±5% relative humidity.
Pyrophoric	Gas	A gas with an autoignition temperature in air, at or below a temperature of 130°F (54 °C).	H220, Category 1A; Extremely flammable gas. May ignite spontaneously if exposed to air: A pyrophoric gas is a flammable gas that is liable to ignite spontaneously in air at a temperature of 54°C or below. H280, compressed (or liquefied) gas would also apply.

Toxic	-	A chemical falling within any of the following categories: 1. A chemical that has a median lethal dose (LD50) of more than 50 mg per kg, but not more than 500 mg per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each. 2. A chemical that has a medial lethal dose (LD50) of more than 200 mg per kg but not more than 1,000 mg per kg of body weight when administered by continuous contact for 24 hrs (or less if death occurs within 24 hrs) with the bare skin of albino rabbits weighing between 2 and 3 kg each. 3. A chemical that has a median lethal concentration (LC50) in air of more than 200 ppm but not more than 2,000 ppm by volume or less of gas or vapor, or more than 2 mg/l but not more than 20 mg/l of mist, fume or dust, when administered by continuous inhalation for 1 hr (or less if death occurs within 1 hr) to albino rats weighing between 200 and 300 g	Acute toxicity refers to serious adverse health effects (i.e., lethality) occurring after a single or short-term oral, dermal or inhalation exposure to a substance or mixture. Oral: H301, Category 3; Toxic if swallowed: LD50 > 50 ≤ 300 mg/kg bodyweight H302, Category 4; Harmful if swallowed: LD50 > 300 ≤ 2,000 mg/kg bodyweight Dermal: H311, Category 3, Toxic in contact with skin: LD50 > 200 ≤ 1,000 mg/kg bodyweight Inhalation: H330, Category 2; Fatal if inhaled: Gases: LC50 > 100 ppm (4 hr) ≈ 200 ppm (1 hr) ≤ 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) Vapors: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) Dust/mist: LC50 > 0.05 mg/l (4 hr) ≈ 0.2 mg/l (1 hr) ≤ 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) H331, Category 3; Toxic if inhaled: Gases: LC50 > 500 ppm (4 hr) ≈ 1,000 ppm (1 hr) ≤ 2,500 ppm (4 hr) ≈ 5,000 ppm (1 hr) Vapors: LC50 > 2 mg/l (4 hr) ≈ 8 mg/l (1 hr) ≤ 10 mg/l (4 hr) ≈ 40 mg/l (1 hr) Dust/mist: LC50 > 0.5 mg/l (4 hr) ≈ 2 mg/l (1 hr) ≤ 1 mg/l (4 hr) ≈ 4 mg/l (1 hr)
Unstable (reactive)		A material, other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self- reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials. Unstable (reactive) materials are subdivided as follows:	Self-reactive substances or mixtures are thermally unstable liquids or solid substances or mixtures liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). This definition excludes substances and mixtures classified under the GHS as explosives, organic peroxides or as oxidizing. A self-reactive substance or mixture is regarded as possessing explosive properties when in laboratory testing the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.
Unstable (reactive)	4	Materials that in themselves are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. This class includes materials that are sensitive to mechanical or localized thermal shock at normal temperatures and pressures.	H240, Type A; Heating may cause an explosion: Any self-reactive substance or mixture which can detonate or deflagrate rapidly, as packaged, will be defined as self-reactive substance TYPE A;
Unstable (reactive)	3	Materials that in themselves are capable of detonation or of explosive decomposition or explosive reaction but which require a strong initiating source or which must be heated under confinement before initiation.	H241, Type B; Heating may cause a fire or explosion: Any self-reactive substance or mixture possessing explosive properties and which,as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package will be defined as self-reactive substance TYPE B;

		This class includes materials that are sensitive to thermal or mechanical shock at the elevated temperatures and pressures.	
Unstable (reactive)	2	Materials that in themselves are normally unstable and readily undergo violent chemical change but do not detonate. This class includes materials that can undergo chemical change with rapid release of energy at normal temperatures and pressures, and that can undergo violent chemical change at elevated temperatures and pressures.	H242, Type C; Heating may cause a fire: Any self-reactive substance or mixture possessing explosive properties when the substance or mixture as packaged cannot detonate or deflagrate rapidly or undergo a thermal explosion will be defined as self- reactive substance TYPE C; H242, Type D; Heating may cause a fire: Any self-reactive substance or mixture which in laboratory testing: Detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or Does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or Does not detonate or deflagrate at all and shows a medium effect when heated under confinement; Will be defined as self-reactive substance TYPE D;
Unstable (Reactive)	1	Materials that in themselves are normally stable but which can become unstable at elevated temperatures and pressures.	H242, Type E; Heating may cause a fire: Any self-reactive substance or mixture which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement will be defined as self-reactive substance TYPE E; H242, Type F; Heating may cause a fire: Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power will be defined as self-reactive substance TYPE F; Any self-reactive substance or mixture which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power, provided that it is thermally stable (self- accelerating decomposition temperature is 60 °C to 75 °C for a 50 kg package), and, for liquid mixtures, a diluent having a boiling point greater than or equal to 150 °C is used for desensitization will be defined as self-reactive substance TYPE G. If the mixture is not thermally stable or a diluent having a boiling point less than 150°C is used for desensitization, the mixture shall be defined as self-reactive substance TYPE F.

Unstable (reactive) gas	Gaseous		A chemically unstable gas is a flammable gas that is able to react explosively even in the absence of air or oxygen. H220, Category 1A, Category A; Extremely flammable gas. May react explosively even in the absence of air: Flammable gases which are chemically unstable at 20°C and a standard pressure of 101.3 kPa. H220, Category 1A, Category B; Extremely flammable gas. May react explosively even in the absence of air at elevated pressure and/or temperature: Flammable gases which are chemically unstable at a temperature greater than 20°C and/or a standard pressure greater than 101.3 kPa. H280, compressed gas would also apply.
Water reactive	3	Materials that react explosively with water without requiring heat or confinement.	H260, Category 1; In contact with water releases flammable gases which may ignite spontaneously: Any substance or mixture which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 liters per kilogram of substance over any one minute. (UN/DOT test methods: Test N.5, Part III, sub-section 33.4.1.4)
Water reactive	2	Materials that react violently with water or have the ability to boil water. Materials that produce flammable, toxic or other hazardous gases, or evolve enough heat to cause autoignition of combustibles upon exposure to water or moisture.	H261, Category 2; In contact with water releases flammable gas: Any substance or mixture which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 liters per kilogram of substance per hour, and which does not meet the criteria for Category 1.
Water reactive	1	Materials that react with water with some release of energy, but not violently.	H261, Category 3; In contact with water releases flammable gas: Any substance or mixture which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 liters per kilogram of substance per hour, and which does not meet the criteria for Categories 1 and 2.

a. The table illustrates that there is not perfect alignment between the IFC and GHS definitions and provides information on similarities and difference between the two classification systems.

TABLE ~~E104.1~~ E105.1

REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
CGA P-20— 2009	*Standard for Classification of Toxic Mixtures*	E103.1.3.1
CGA P-23— 2008	*Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components*	E102.1.2

DOL 29 CFR Part 1910—2023	*Occupational Safety and Health Standards*	E104.1
DOL 29 CFR Part 1910.1200—2012	*Hazard Communication*	E102.1.7.2, E104.1, E104.2
DOTn 49 CFR—2023	*Transportation*	E104.1
DOTn 49 CFR Part 173.127—2005	*Class 5, Division 5.1—Definition and Assignment of Packing Groups*	E102.1.7.2
UN ST/SG/AC.10/11 (Rev. 7)—2019	*Manual of Tests and Criteria*	Table E104.2
UN ST/SG/AC.10/1 (Rev 21)—2019	*Recommendations on the Transport of Dangerous Goods*	Table E104.2
UN ST/SG/AC.10/30 (Rev.7)—2017	*Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Part 2: Physical Hazards*	E102.1.7.2, E104.1, E104.2, Table E104.2

Appendix H

SECTION H104 SECURITY

H104.1 General. Hazardous materials storage, dispensing, use and handling areas shall be secured against unauthorized entry and safeguarded in a manner *approved* by the fire *code official*.

H104.2 Chemical Facility Anti-Terrorism Standards (CFATS). Chemical facilities deemed to be high risk by the U.S. Department of Homeland Security shall be required to develop and implement security plans in accordance with the Chemical Facility Anti-Terrorism Standards set forth in DHS CFATS 6 CFR Part 27.

SECTION ~~H104~~ H105 REFERENCED STANDARDS

H105.1 General. See Table H105.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE H105.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
DHS CFATS 6 CFR Part 27—2007	*Chemical Facility Anti-Terrorism Standards*	H104.2
IBC—24	*International Building Code*	H102.1

Appendix I

I101.2 Impaired conditions requiring immediate action. The following conditions indicate noncompliant and impaired fire protection systems. An impaired system(s) shall require immediate action by the building owner to return the fire protection system back to service:

1. Valves in the shut or closed position:
    1.1. Water supply valves, such as in riser rooms, yards, and vaults.
    1.2. Water supply floor control valves in multi-story buildings.
    1.3. Fuel supply valves for fire pumps.
    1.4. Commercial kitchen hood suppression valves
2. Impaired fire alarm systems:
    2.1. Fire alarm systems with no power (primary or secondary).
    2.2. No active communication path to the supervising/remote station (unless the system is local)

~~**I101.2**~~ **I101.3 Noncompliant conditions requiring component replacement.** The following conditions shall be deemed noncompliant and shall cause the related component(s) to be replaced to comply with the provisions of this code:

1. Sprinklers ~~heads~~ having any of the following conditions:
    1.1. Signs of leakage.
    1.2. Paint or other ornamentation that is not factory applied.
    1.3. Evidence of corrosion including, but not limited to, discoloration or rust.
    1.4. Deformation or damage of any part.
    1.5. Improper orientation of sprinkler ~~head~~.
    1.6. Empty glass bulb.
    1.7. Sprinklers ~~heads~~ manufactured prior to 1920.
    1.8 Replacement sprinklers ~~heads~~ that do not match existing sprinklers in orifice size, K-factor temperature rating, coating or deflector type.
    1.9. Sprinklers ~~heads~~ for the protection of cooking equipment that have not been replaced within one year.
2. Water pressure and air pressure gauges: ~~that have been installed for more than 5 years and have not been tested to within 3 percent accuracy.~~
    2.1. Installed for more than 5 years and have not been tested to within 3 percent accuracy.
    2.2. Indicating zero pressure.

~~**I101.3**~~ **I101.4 Noncompliant conditions requiring component repair or replacement.** The following shall be deemed noncompliant conditions and shall cause the related component(s) to be repaired or replaced to comply with the provisions of this code:

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
    1.1. Signs of leakage.
    1.2. Evidence of corrosion.
    1.3. Misalignment.
    1.4. Mechanical damage.
2. Sprinkler piping support having any of the following conditions:
    2.1. Materials resting on or hung from sprinkler piping.
    2.2. Damaged or loose hangers or braces.

3. Class II and Class III standpipe systems having any of the following conditions:
   3.1. No hose or nozzle, where required.
   3.2. Hose threads incompatible with fire department hose threads.
   3.3. Hose connection cap missing.
   3.4. Mildew, cuts, abrasions and deterioration evident.
   3.5. Coupling damaged.
   3.6. Gaskets missing or deteriorated.
   3.7. Nozzle missing or obstructed.
4. Hose racks and cabinets having any of the following conditions:
   4.1. Difficult to operate or damaged.
   4.2. Hose improperly racked or rolled.
   4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.
   4.4. Cabinet locked, except as permitted by this code.
   4.5. Cabinet door will not fully open.
   4.6. Door glazing cracked or broken.
5. Portable fire extinguishers having any of the following conditions:
   5.1. Broken seal or tamper indicator.
   5.2. Expired maintenance tag.
   5.3. Pressure gauge indicator in “red.”
   5.4. Signs of leakage or corrosion.
   5.5. Mechanical damage, denting or abrasion of tank.
   5.6. Presence of repairs such as welding, soldering or brazing.
   5.7. Damaged threads.
   5.8. Damaged hose assembly, couplings or swivel joints.
6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:
   6.1. Corroded or leaking batteries or terminals.
   6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
   6.3. Mechanical damage to ~~heat or smoke detectors~~ any fire alarm equipment, devices, or appliances.
   6.4. Tripped fuses.
   6.5 Fire alarm systems not in "normal" (no alarm, supervisory, or trouble) state.
7. Fire department connections having any of the following conditions:
   7.1. Fire department connections are not visible or able to be accessed from the fire apparatus access road.
   7.2. Couplings or swivels are damaged.
   7.3. Plugs and caps are missing or damaged.
   7.4. Gaskets are deteriorated.
   7.5. Check valve is leaking.
   7.6. Identification signs are missing.
8. Fire pumps having any of the following conditions:

8.1. Pump room temperature is less than 40°F (4.4°C).

8.2. Ventilating louvers are not freely operable.

8.3. Corroded or leaking system piping.

8.4. Diesel fuel tank is less than two-thirds full.

8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

Appendix L

L104.6 Isolation valves. System isolation valves that ~~are accessible to~~ allow access for the fire department shall be installed on the system riser to allow piping beyond any air cylinder refill panel to be blocked.

L104.14.1 Location. The location of the external mobile air connection shall ~~be accessible to~~ have access for mobile air apparatus and *approved* by the *fire code official*.

Appendix N

N102.1 Definitions.

MULTIPLE-LEVEL BOOTH. An exhibit that has a second level or tier constructed on top of the exhibit or portion of the exhibit that is ~~accessible~~ open to the public, or includes a live load above the exhibit area floor level.

N107.5 ~~Liquid propane~~ LP-gas containers. ~~Liquid propane~~ Liquefied petroleum (LP) gas containers shall comply with Sections N107.5.1 through N107.5.5 and Chapter 61.

N107.5.1 LP-gas containers exceeding 12 pounds (5 kg) of water capacity. The use of LP-gas containers exceeding 12 pounds (5 kg) of water capacity shall be prohibited.

N107.5.2 Where more than one LP-gas container is present in the same area. Where more than one LP-gas container is present in the same area, ~~the aggregate weight of all containers in the area shall not exceed 12 pounds (5 kg) of water capacity~~ cylinders shall be separated from each other by a minimum of 20 feet (6096mm).

APPENDIX O

APPENDIX O

VALET TRASH AND RECYCLING COLLECTION IN GROUP R-2 OCCUPANCIES

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or legislation of the jurisdiction.

About this appendix: Appendix O provides for valet trash and recycle collection services in Group R-2 occupancies. These collection services are formally defined in Section 2020 as "Valet Trash Collection," which includes recycling. Occupants receiving this service place trash and recyclables in the corridor outside of their residence for pickup by a collection service on a regularly scheduled basis in accordance with restrictions, as prescribed by this appendix.

SECTION O101 SCOPE.

O101.1 Scope. *Valet trash collection* in Group R-2 Occupancies shall comply with this Appendix.

SECTION O102 CONTAINERS.

O102.1 General. Containers used for *valet trash collection* shall comply with Sections O102.2 through O102.5.

O102.2 Integrity. Valet trash or recycling materials shall be stored in containers that are of liquid-tight construction and equipped with lids. Lids shall be in the fully closed position.

O102.3 Height. Containers shall not exceed 30inches (762mm) in height.

O102.4 Capacity and limit. Individual containers shall not exceed 2.0 cubic feet (15 gallons; 56.8 L) in capacity. Only one trash or recycling container per *dwelling unit* or *sleeping unit* shall be permitted to be placed outside of the *dwelling unit* or *sleeping unit* at one time. Trash and recycling containers shall not be placed outside of a *dwelling unit* or *sleeping unit* at the same time.

O102.5 Construction materials. Containers and lids used for *valet trash collections* shall be constructed entirely of noncombustible materials, or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation.

SECTION O103 CONTAINER LOCATION.

O103.1 General. Placement of containers used for *valet trash collection* outside of a *dwelling unit* or *sleeping unit* shall comply with Sections O103.2 and O103.3.

O103.2 Minimum means of egress width. Containers used for *valet trash collection* shall not obstruct the minimum required egress width.

O103.3 Stairways. Containers used for *valet trash collection* shall not be placed on stair risers, within minimum required stairway landing dimensions, or anywhere in an *interior exit stairway*.

SECTION O104 ADDITIONAL REQUIREMENTS.

O104.1 Time limits. Filled containers used for valet trash or recycling services shall not be placed outside a *dwelling unit* for more than 6 hours within in any 24-hour period. Empty *approved* containers used for valet trash or recycling services shall not remain in a *corridor* for more than 12 continuous hours in a 24 hour period.

O104.2 Collection rules. The property owner or manager shall have written valet service rules, hours and penalties provided to all tenants and occupants. The property owner or manager shall be responsible for implementing, monitoring, and enforcing all *valet trash collection* rules. A copy of the rules shall be provided to the *fire code official upon* request.

O104.3 Suspension of service. The *fire code official* has the authority to order the suspension of *valet trash collection* that is not in compliance with this appendix.

SECTION O106 REFERENCED STANDARDS.

O105.1 General. See Table O105.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE O105.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
ASTM E1354-17	*Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*	O102.5