CITY OF LAS VEGAS
CITY OF HENDERSON
AMENDMENTS TO THE
2021 INTERNATIONAL FIRE CODE

Including Various NFPA Standards

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Table of Contents

INTERNATIONAL FIRE CODE

101.2.1

New appendixes

101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The following appendices are hereby adopted and are a part of this code:

Appendix B – Fire-flow requirements for buildings, as amended.
Appendix C – Fire hydrant locations and distribution, as amended.
Appendix H – Hazardous materials management plan (HMMP) and hazardous materials inventory statement (HMIS) instructions
Appendix O – Proprietary (self) monitoring, as amended.
Appendix P – Impairment Procedures, as amended.

102.7.3

New section with referenced standards

102.7.3 Local codes. The revised locally adopted codes listed below shall replace the listed referenced documents. References contained herein shall refer to the locally adopted codes.

IMC-21 International Mechanical Code is replaced with 2018 Uniform Mechanical Code
IPC-21 International Plumbing Code is replaced with 2018 Uniform Plumbing Code
70-20 National Electrical Code 2020 is replaced with the 2017 National Electrical Code

104.13

New section detailing Fire Protection Reports

104.13 Fire Protection Reports. All high-rise, covered mall, and atrium buildings, in addition to other complex or major facilities as determined by the *fire code official*, including but not limited to Group H and Group I occupancy buildings, shall have a Fire Protection Report submitted and approved prior to construction, demolition, or significant work stoppage. Fire protection reports shall be prepared by an architect or professional engineer working in their area of expertise.

104.13.1 Building Fire Protection Reports. Building fire protection reports shall describe the building uses, construction, and life safety features of the entire building.

104.13.2 Tenant Improvement and Remodel Fire Protection Reports. A Fire Protection Report shall be submitted when any one of the following occurs within a building that would normally require or has a previously approved Fire Protection Report (FPR).

1. The area of remodel occurs over a floor area exceeding 20,000 square feet.
2. The area of remodel is an assembly occupancy with an occupant load that exceeds 1,000 persons.
3. The area of remodel occurs within spaces dedicated to or affecting emergency personnel response areas, such as exit enclosures, elevators, elevator lobbies, fire command centers, secondary response points, fire riser rooms, and fire pump rooms.
4. The tenant improvement space is not intended to install a sprinkler isolation control valve.
5. The remodel area requires specific engineered fire suppression and/or alarm systems that will require an alternate means of system design that is not supported by adopted NFPA codes.
6. The remodel area includes clean agent suppression systems, new or existing.
7. The remodel includes kitchen exhaust systems that are used for smoke control or smoke removal and thereby requiring coordination of exhaust fan functioning.

8. The remodel area contains hazardous materials storage and/or use areas in any amount.
9. The remodel area includes high-piled storage.
10. The remodel area includes access-controlled egress doors, delayed egress door hardware or other hardware systems that are interconnected with fire protection systems.
11. The remodel area modifies an existing smoke control system, smoke removal system, smoke control boundary or smoke removal boundary and the *fire code official* requires submittal of a remodel FPR.
12. Fire Prevention tenant improvement and/or remodel reports are also required for all assembly, residential, high rise, covered mall, atrium and other complex or major facilities that have a previously approved FPR when required by the *fire code official.*

104.13.3 Alternate materials and methods report. An Alternate Materials and Methods Request shall be submitted when any of the following items are involved.

1. All instances where active fire protection features are offered as a mitigation in support of an alternative solution.
2. All requests relating to or referencing the International Fire Code or NFPA codes adopted within the International Fire Code.
3. All requests that involve alternate installation requirements of any active fire protection system governed by either the International Fire Code or Chapter 9 of the International Building Code, such as: *automatic sprinkler system*s, alternative automatic fire extinguishing systems, standpipe systems, fire alarm and detection systems, emergency alarm systems, fire department connections and smoke control graphic annunciator panels. Additionally, requests involving the modification of the following items shall be submitted to the *fire code official*: smoke and heat vents, fire command centers, thin combustible ceilings, hazardous materials, and alternate hardware when it may affect entry into a building by emergency responders.

104.13.4 Temporary Certificate of Occupancy (TCO) Fire Protection Report. When a temporary certificate of occupancy (TCO) is requested in a building that required a fire protection report prior to construction, the *fire code official* is authorized to require a fire protection report describing the uses to be occupied, the completed construction features, and the status of life safety systems, be submitted and approved prior to approval of the TCO request.

104.13.5 Hazardous materials, fog effects, and asphyxiants. Complex permits for hazardous materials, fog effects, and asphyxiants shall have fire protection reports submitted to address the hazards of the installation, as required by the *fire code official.*

105.1.7

New section detailing insurance requirements.

105.1.7 Certificate of Insurance. A valid Certificate of Insurance shall be submitted to, or be on file with, the *fire code official* when applying for a permit to conduct specific operations.

Exception: The requirement for an insurance certificate may be waived by the fire code official's Risk Manager.

105.1.7.1 Certificate Information Required. The certificate shall be issued by an insurance company authorized to conduct business in the State of Nevada or be named on the list of authorized insurers maintained by the Nevada Department of Business and Industry, Division of Insurance.
The following information shall be provided on the certificate:

1. The contractor shall be named as the insured. If the insurance is provided by an individual, company or partnership other than the contractor, the contractor shall be named as an additional insured.
2. "*insert name of jurisdiction* it's agents, employees and volunteers" shall be named as both an additional insured and certificate holder.
3. General liability limits, including contractual liability, in the minimum amounts specified below of the specific operation being conducted:

a. To erect temporary membrane structures, tents, or canopies. See Chapter 31 $2,000,000.
b. To store or use explosive materials or pyrotechnic displays. See Chapter 56: $5,000,000

Exception: The *fire code official* is authorized to reduce the liability limits to $1,000,000 for small private party blasting operations such as personal mining claims or agricultural uses and for stands for Safe and Sane fireworks. Under no circumstance will this include development related blasting activities, quarry blasting, construction blasting, or other similar large scale blasting operations.
c. To operate a special amusement building. See Chapter 9. $2,000,000.

105.1.7.2 Additional Insurance. Greater liability insurance amounts may be required in certain cases (such as building implosions) as deemed necessary by the *fire code official*.

105.5.5

Delete 105.5.5 Carnivals and Fairs

Table 105.5.9

Amend table to include operational permit for Liquid carbon dioxide.

Table 105.5.9
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NPT)
Carbon dioxide used in carbon dioxide enrichment systems	875 (100 lbs.)
Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications or Theatrical Fog Effects	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
Liquefied carbon dioxide	875 (100 lbs.)

105.5.29

Amended exception changing requirements for operational permit.

105.5.29 LP-gas. An operational permit is required for:
1. Storage and use of LP-gas.

Exceptions:
1. An operational permit is not required in Group R-3 occupancies and buildings constructed in accordance with the IRC.
2. An operational permit is not required for individual containers with a 30-gallon (113.6 L) water capacity or less or multiple containers having an aggregate quantity not exceeding 30 gallons (113.6 L).

2. Operation of cargo tankers that transport LP-gas.

105.5.53 thru 105.5.59

Added seven new operational permits.

105.5.53 Emergency responder radio coverage system. An operational permit is required to operate an emergency responder radio coverage system regulated by Chapter 5.

105.5.54 Monitoring facilities. An operation permit is required for any facility that remotely monitors electronic signals initiated by fire protection systems such as central or supervising facilities.

105.5.55 Proprietary (self) monitoring. An operational permit is required to operate an onsite proprietary (self) monitoring fire alarm system. See Appendix O.

105.5.56 Smoke Control and Removal Systems. An operational permit is required for facilities that have smoke control and/or removal systems.

105.5.57 Special Activity. An operational permit is required at locations that operate Christmas trees, pumpkin patch lots, and similar activities. See Section 323.

105.5.58 Tire storage. An operational permit is required to store tires in excess of 1,000 cubic feet (28.3 m^3). See Chapter 34

105.5.59 Wood and plastic pallets. An operational permit is required for new and existing facilities which store more than 50 idle pallets on site, either inside or outside of a building. See Section 315.

105.6.2

Added exception 3.

105.6.2 Compressed gases. Where the compressed gases in use or storage exceed the amounts listed in Table 105.5.9, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service or close or substantially modify *a compressed gas system.*

Exceptions:

1. Routine maintenance
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two business days of commencement of work.
3. Category 3 compressed air and/or piped vacuum systems as defined by NFPA 99, *Standard for Health Care Facilities.*

105.6.6

Amend as follows:

105.6.6 Fire alarm and detection systems, related equipment and dedicated function fire alarm systems (i.e., monitoring). A construction permit is required for the following:

1. Installation of or modification (including but not limited to extending; reprogramming; upgrading field programmable EPROM, or altering) to fire alarm and detection systems, related equipment, and dedicated function fire alarm systems.
2. Replacement of recalled fire protection components.
3. Control equipment replacement.

Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.6.25 thru 105.6.29

Added new construction permits.

105.6.25 Fire Protection Report. A permit is required for the review and approval of a Fire Protection (Life Safety) Report. See Chapter 1.

105.6.26 Proprietary (self) monitoring facilities. The *Fire code official* is authorized to require a construction permit for the installation of or modification to an onsite proprietary (self) monitoring facility. See Appendix O

105.6.27 Refrigeration systems. A construction permit is required for installation of a mechanical refrigeration system covered by Section 608.

105.6.28 Two-way communication. A construction permit is required for the installation of or modification to a two-way communication system. See Section 1009.8.

105.6.29 Water tanks A construction permit is required for the installation of or modification to a water tank used for supply of a fire protection system. See Chapter 9 and NFPA 22.

Exception: Permits are not required for installation of tanks controlled by a water purveyor governed by the Nevada Public Service Commission, a State of Nevada charter, or other public franchise.

111

Delete Section 111 Means of Appeals.

202

Amended portions of the definition for occupancy classification. Amend as follows:

SECTION 202
GENERAL DEFINITIONS

[**BG] Group E, day care facilities.** This group includes buildings and structures, or portions thereof occupied by more than five children older than 2 1/2 years of age who receive educational, supervision or personal care services for less than 24 hours per day.

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

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

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

[BG] Institutional Group I-4, day care facilities. This group shall include buildings and structures occupied by more than six persons of any age who receive custodial care for less than 24 hours per day 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] Classification as Group E. A child day care facility that provides care for more than six but no more than 100 children 2½ 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 childcare rooms have an *exit* door directly to the exterior, shall be classified as Group E.

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

[BG] Six or fewer persons receiving care. A facility having six or fewer persons receiving custodial care shall be classified as part of the primary occupancy.

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

Apartment houses
Condominiums (nontransient)
Congregate living facilities (nontransient) with more than 16 occupants
Boarding houses (nontransient)
Convents
Dormitories
Fraternities and sororities
Monasteries
Hotels (nontransient)
Live/work units
Motels (nontransient)
Vacation timeshare properties

[BG] 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 six or fewer persons receiving care
Congregate living facilities (nontransient) with 16 or fewer occupants
Boarding houses (nontransient)
Convents
Dormitories
Fraternities and sororities
Monasteries
Congregate living facilities (*transient*) with 10 or fewer occupants
Boarding houses (transient)
Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants

[BG] Care facilities within a dwelling. Care facilities for six 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 or with Section P2904 of the *International Residential Code*.

SMOKE CONTROL, DEDICATED SYSTEMS. Dedicated smoke-control systems are intended for the purpose of smoke control only. They are separate systems of air moving and distribution equipment that do not function under normal building operating conditions. Upon activation, these systems operate specifically to perform the smoke-control function.

SMOKE CONTROL, NON-DEDICATED SYSTEMS. Non-dedicated systems are those that share components with some other system(s) such as the building HVAC system. Activation causes the system to change its mode of operation to achieve the smoke-control objectives.

307.2

Deleted bonfire from base code.

307.2 Permit required. A permit shall be obtained from the *fire code official* in accordance with Section 105.5 prior to kindling a fire for recognized silvicultural or range or wildlife management practices, or prevention or control of disease or pests. Application for such approval shall only be presented by and permits issued to the owner of the land upon which the fire is to be kindled.

Exception: Prescribed burning for the purpose of reducing the impact of wildland fire when authorized by the *fire code official*.

307.4.1

Amend section as follows:

307.4.1 Bonfires. Bonfires are prohibited.

307.4.4

New section

307.4.4 Commercial Barbecue. Barbecue pits used for commercial cooking operations shall be constructed as commercial food heat-processing equipment in accordance with the Mechanical Code. Barbecue pits in outdoor locations shall be constructed of concrete or approved noncombustible materials and shall not be located within 10 feet (3048 mm) of combustible walls or roofs or other combustible material.

307.5

New amendment delete bonfire. Amend as follows:

307.5 Attendance. *Open burning, recreational* fires and use of portable outdoor fireplaces shall be constantly attended until the fire is extinguished. 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, such as dirt, sand water barrel, garden house or water truck, shall be available for immediate utilization.

307.6

New section

307.6 Portable and Permanent outdoor fireplaces, fire pits and decorative appliances. Outdoor fireplaces, fire pits and decorative appliances fueled by LP-gas or natural gas used in assembly occupancies or for public display are to be certified by a nationally recognized testing agency. The certification shall be applicable to the entire assembly. Reference codes, standards, and applicable American National Standards Institute (ANSI) shall apply.

308.1.4

Added verbiage from open flame cooking in exception 2. Removed exception 3. Amend as follows:

308.1.4 Open-flame cooking devices. Charcoal burners and other open-flame cooking devices shall not be located above the first story, 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*, open flame cooking devices utilizing natural gas installed under a construction permit issued by the building code official.

308.1.6.2

Added exception 5. Amend as follows:

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:

1-4. Unchanged

5. Portable stoves used in accordance with their listing and listed by an *approved* nationally recognized testing laboratory per ANSI Z21.72/CSA 11.2, Portable Type Gas Camp Stoves.

308.1.9

New sections 308.1.9 – 308.1.9.5

308.1.9 Open-flame devices. Open-flame devices shall comply with the applicable requirements of Sections 308.1.9.1 through 308.1.9.5. Fire pits and theatrical flame effects are regulated in Sections 307 and 308.3.2, respectively.
Exception: One- and two-family dwellings.

308.1.9.1

308.1.9.1 Prohibited Materials. Open flame devices using Class I or Class II flammable liquids, or toxic materials shall be prohibited. Combustible metals shall not be used or demonstrated indoors,

Exception: Open flame devices that utilize gelled alcohol fuel per 308.1.9.3.

308.1.9.2

308.1.9.2 Candles, Oil Lamps and Tea Lights. Candles, oil lamps and tea lights shall comply with all the following:

1. The flame shall be fully enclosed except where openings on the side are not more than 0.375 inch (9.5 mm) in diameter or where the opening over the top is at a distance away from the flame that does not allow a piece of tissue paper to ignite after ten seconds.
2. Candles and tea lights shall be constructed with a device or holder that prevents spillage of wax or liquid fuel at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when held at an angle of 45 degrees.
3. Oil lamps containing more than 8 ounces (237 ml) shall self-extinguish and not leak at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when held at an angle of 45 degrees.
4. Holders and chimneys shall be made of noncombustible materials. Chimneys are not required for candles, oil lamps or tea lights that self-extinguish when tipped over.
5. Shades, where used, shall be made of noncombustible materials, and securely fastened to the open flame device holder or chimney.

Exception: Candelabras securely fastened in place to prevent overturning located at least five feet away from combustible materials.

308.1.9.3

308.1.9.3 Alcohol Burning Decorative Devices. Fixed unvented gelled or liquid alcohol burning decorative appliances shall be listed per UL 1370, *Standard for Unvented Alcohol Fuel Burning Decorative Appliances.*

308.1.9.4

308.1.9.4 Alcohol Burning Food Warming Devices. Food warming devices shall be used in accordance with the manufacturer's operating instructions. The fuel shall be compatible with the appliance per the manufacture's operating instructions.

308.1.9.4.1 Transport while lit. Alcohol burning food warming devices shall not be transported while lit unless secured in a holder designed for the device.

308.1.9.4.2 Shielding. Shielding that surrounds alcohol burning food warming devices shall be of non-combustible materials.

308.1.9.5

308.1.9.5 Tiki Torches. Tiki torches using combustible liquid fuels shall comply with the following:

1. The torches shall be ignited and used outdoors only.
2. The torches shall not leak unburned fuel.
3. The torches shall be securely fastened to a base to prevent tipping and located a minimum of five feet from combustibles.

308.3.1

Delete Section 308.3.1 Open-flame decorative devices.

315.3.2.1

New section

315.3.2.1 Group A occupancies. Corridors and hallways, except for 1-hour rated corridors used to extend travel distance to an exit, serving new and existing Group A Occupancies that are oversized with floor space exceeding the required egress width are permitted to contain combustible storage incidental to the use of the occupancy when all the following are provided:

1. Maximum height of storage is 8 feet with top of storage a minimum of 18 inches below sprinkler deflectors.
2. Quick response sprinklers designed per the requirements for an ordinary hazard group II occupancy, or higher design based on the items stored and the proposed storage configuration.
3. Approved permanent durable floor plan(s) showing the assembly use, storage area, corridors and hallways are installed at a location(s) as required by the *fire code official.*
4. Plans approved by the b*uilding code official* identifying the minimum required width of the corridors or hallways.
5. When required by the *fire code official*, a fire protection report shall be submitted addressing the parameters of storage, including protection requirements, separation requirements, and description of commodity type and configuration.
6. Master egress drawings are provided to the *fire code official* and the *building official*.

The *approved* storage area shall be separated from egress by barriers. Barriers shall be a minimum of 8 feet (2438 mm) in height if walls or fencing are used. Barriers may include the following:

1. Walls
2. Fencing

3. When approved by the *fire code official*, approved permanent delineation on the floor surface of the corridor or hallway marking the extent of permitted storage.

The following items and operations shall be prohibited from these corridors and hallways:

1. Hazardous materials that may be moved through the back-of-house exit access corridor or hallway but prohibited from staging or storage: flammable and combustible liquids, highly combustible goods, LP-gas, pool chemicals, pyrotechnics, paint thinners and the like.
2. Maintenance to permanent fixtures or equipment may be temporarily performed within back-of-house exit access corridors. Operations that can be relocated to shop areas or not essentially required to be performed within the back-of-house exit access corridors are prohibited.
3. Cooking shall not be permitted within back-of-house exit access corridors.

322

New sections 322.1 – 322.5

SECTION 322
INDOOR TRADE SHOWS AND EXHIBITIONS

322.1 General. Indoor Exposition and Trade Show Facilities are addressed in this section. These include, but are not limited to exhibition halls, convention general sessions, association meetings, product convention showrooms, trade shows with or without booths, and political conventions that constitute temporary assembly uses. An operational permit shall be obtained in accordance with Section 105.5.39.

322.2 Exhibit Booths. Booths shall comply with 322.2.1 through 322.2.5.

322.2.1 Automatic Sprinklers.

322.2.1.1 Exhibit booths exceeding 1,500 square feet are not permitted in non-sprinklered buildings.

322.2.1.2 Single-level exhibit booths exceeding 1,000 sq. ft. (93 sq. m.) and covered with a ceiling shall be protected by automatic fire sprinklers installed within the booth.

> **Exception:** Where the booth is used in an event with duration less than 7 calendar days and does not contain vehicles, open flame or hot works, automatic fire sprinklers are not required.

322.2.1.3 Each level of multi-level exhibit booths shall be protected by an automatic fire sprinkler system installed within the booth where the accessible floor area of the upper walking level(s) is greater than 1000 sq ft. (93 sq. m).

> **Exception:** Where the booth is used in an event with duration less than 7 calendar days and does not contain vehicles, open flame or hot works, automatic fire sprinklers are not required.

322.2.1.4 The water supply and piping for the fire sprinkler protection for exhibit booths shall be an approved temporary means provided by an existing standpipe system or an existing fire sprinkler system.

322.2.1.5 Hydraulic calculations shall be provided to the Authority Having Jurisdiction when the sprinklers required by Section 320.2.1.2. They are to be supplied by the standpipe system or in a hydraulically most remote location as defined by the currently adopted edition of Standard for the Installation of Sprinklers, NFPA 13.

322.2.2 Horizontal Separation between Booths. A covered single exhibit (booth) or group of covered exhibits (booths) that do not require fire sprinklers shall be separated by a distance of not less than 8 ft. (2.4 m) from other covered exhibit booths where the aggregate ceiling exceeds 1000 sq. ft. (93 sq. m.).

322.2.3 Travel Distance within Booths. The travel distance within the exhibit booth or exhibit enclosure to an exit access aisle shall not exceed 50 ft. (15 m).

322.2.4 Means of Egress from Multi-level Booths. The upper deck of multi-level exhibit booths exceeding 300 sq. ft. (28 sq. m.) shall have not less than two remote means of egress.

322.2.5 Construction Materials. Exhibit booths shall be constructed using any of the following:

(1) Noncombustible or limited combustible materials
(2) Wood exceeding ¼ in. (6.3 mm) nominal thickness
(3) Wood that is pressure-treated, fire-retardant wood meeting the requirements of NFPA 703, *Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials.*
(4) Flame-retardant materials complying with one of the following:
    a. They shall meet the flame propagation performance criteria contained in Test Method 1 or Test Method 2, as appropriate of NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*
    b. They shall exhibit a heat release rate not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source.
(5) Textile wall coverings, such as carpeting and similar products used in wall or ceiling finishes complying with Section 803.5 of the IFC.
(6) Plastics limited to a Class A flame spread index.
(7) Foamed plastics and materials containing foamed plastics complying with Section 807.5.1 of the IFC.
(8) Cardboard, honeycombed paper, and other combustible materials having a heat release rate for any single fuel package that does not exceed 150 kW where tested in accordance one of the following:
    a. ANSI/UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes*
    b. NFPA 289 using the 20 kW ignition source
(9) Alternate materials as approved by the *fire code official*.

322.3 Decorative Curtains, and Textiles.

322.3.1 Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 322, and shall not be required to comply with Section 807. Curtains, drapes and textiles shall comply with Standard Method of Fire Tests for Flame Propagation of Textiles and Films, NFPA 701, Test Method 2. Compliance shall be indicated by a tag affixed to each curtain, drape, or textile. The tag shall be affixed by the owner of the material after gaining assurance that the material is inherently flame retardant, provided with current flame-retardant treatment, or otherwise is compliant with NFPA 701. The tag shall indicate the name of the owner of the material and a statement indicating compliance with the Fire Code. The *fire code official* is authorized to conduct field test in accordance with the current edition of NFPA 705, *Recommended Practice for a Field Flame Test of Textiles and Films*, on any curtain, drape or textile installed.

322.3.2 Curtains, drapes and textiles shall comply with Standard Method of Fire Tests for Flame Propagation of Textiles and Films, NFPA 701, Test Method 2.

322.3.3 Curtains, drapes or textiles shall not be installed to cover exit signs, means of egress components, sprinklers, strobes, horn-strobes, standpipe outlets, hose cabinets, fire extinguishers, or any other fire protection equipment.

> **Exception:** Free-standing partitions situated in a manner to permit the minimum required egress width to one or both sides of the partition shall be permitted. The paths of egress provided around the partition shall be marked by exit signs complying with Chapter 10.

322.3.4 Ceiling suspended curtains drapes and textiles in exhibition spaces are to have a minimum of 18 inches of clear space between the top of the material and the sprinkler deflector.

> **Exception:** Clearance between the ceiling and the top of the curtain, drape or textile is not required when the curtain, drape, or textile is within 6 inches of a full-height wall.

322.3.5 The amount of temporary ceiling hung curtains, drapes or textiles in exhibition spaces equipped throughout with automatic sprinklers shall not be limited and shall comply with 322.3.1 through 322.3.3.

322.3.6 Artificial decorative vegetation used in exhibits and trade shows shall comply with IFC Section 807.4.

322.4 Demonstration cooking and food warming in exhibition spaces shall comply with the following:

1. All cooking appliances shall be listed or approved by a nationally recognized testing agency.
2. All cooking equipment is to be operated according to the manufacturers' recommendations and operating instructions. Equipment recommended for outdoor use shall not be used indoors.
3. All cooking equipment (deep fat fryers and woks) operations using combustible oils shall meet all the following criteria:
   a. Metal lids sized to cover the horizontal cooking surface are to be provided.
   The cooking surface is limited to 288 sq in (two sq ft).
   b. The fryer is to be separated from all other equipment by a distance not less than 24 in.
   c. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
   d. Deep fat fryers shall be electrically powered and have a shut-off switch.
4. Class-K fire extinguishers shall be provided within 30-ft of each cooking operation in accordance with 906.1.2.
5. Solid fuel cooking equipment shall be protected in accordance with the mechanical code.
6. LP-gas used for displays and demonstrations shall be in accordance with section 6103.2.1.5.

322.5 Plans. Plans for the exhibition or trade show shall be submitted to the authority having jurisdiction for approval, along with application for an operational permit, prior to setting up any exhibit. The plans shall show all pertinent details of the proposed exposition which shall include the following as applicable:

1. Overall floor plan (either drawn to scale or dimensioned properly).
2. Egress analysis showing conformance with Chapter 10 of the IFC.
3. Seating arrangements and/or table and chair configurations.
4. Locations of all exhibits (booths, aisles and exits).
5. Locations of temporary walls, partitions, or curtains.
6. Lobby and registration area usage.
7. Location of temporary platforms (along with any intended use beneath the platform).
8. Location of fire protection equipment (e.g., extinguishers, fire alarm devices, hose cabinets, etc.).
9. Temporary fire sprinkler and fire alarm system/devices to be installed (note: This requires a separate installation permit).
10. Copy of excerpt from show management information guide serving notice that all exhibits shall comply with applicable codes and shall have all necessary Fire Code permits.

323

New sections 323.1 – 323.7

SECTION 323
SPECIAL ACTIVITY LOTS

323.1 General. Special activity lots, including Christmas tree lots, pumpkin patches, hayride lots, and other similar lots, shall comply with this section.

323.2 Permit required. An operational permit shall be obtained prior to commencing special activity lot operations. See Chapter 1.

323.3 Other required permits. Other activities that support the special activity lot, such as a tent, a fuel tank for generators, an amusement building, or any other associated activity, shall have separate permits prior to commencing those other activities. See Chapter 1.

323.4 Arrangement of combustibles. Combustibles, such as Christmas trees, hay bales, and other combustible materials associated with the special activity, shall be arranged on the lot in a manner to mitigate the impact of fire, and shall be arranged in accordance with this section.

323.4.1 Access from fire apparatus access roads. Fire apparatus access roads shall be provided within 150 feet of all portions of the special activity lot, as measured along normal paths of travel.

323.4.2 Clearance from fire apparatus access roads. All combustible materials shall be a minimum of ten (10) feet away from fire apparatus access roads.

323.4.3 Clearance from property lines upon which buildings may be built. All combustible materials shall be a minimum of twenty (20) feet from property lines for property where buildings are or are permitted to be built.

323.4.4 Clearance from fuel dispensers. All combustible materials shall be a minimum of 50 feet away from any fuel dispenser.

323.4.5 Clearance from buildings, building exits, and building exit discharges to the public way. All combustible materials shall be a minimum of ten (10) feet from any building, building exit, and the path of discharge between the building exit and the public way.

323.4.6 Aisles between materials. Aisles having a minimum width of five (5) feet shall be provided between areas containing materials. Sufficient aisles shall be provided such that the area of material storage does not exceed 150 feet in length and 50 feet in width.

323.5 Wiring and lighting. All wiring and lighting shall be listed for outside use, be of proper size and type, and be protected against physical damage. Electrical extension cords with multiple electrical outlets cannot be used unless specifically listed for outdoor use.

323.6 Fire Protection. Fire protection features, such as fire extinguishers and water supply, shall be provided for special activity lots as required by this section.

323.6.1 Fire extinguisher. A minimum two 2 ½ gallon water-type fire extinguisher shall be provided at an approved location for protection against incipient fires.

323.6.2 Water supply. The special activity lot shall be located within 300 feet of a fire hydrant.

323.6.3 Smoking prohibited. Smoking is prohibited on special activity lots. "NO SMOKING" signs with 2-inch high letters on a contrasting background shall be posted at entrances to the special activity lot and to each aisle.

323.6.4 Open burning prohibited. Open burning, such as a campfire, is prohibited on special activity lots.

323.7 Egress. Egress shall be provided as required by this code.

503.2.1

Changed width of fire access road from 20 feet to 24 feet. Amend as follows:

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 24 feet (7315 mm), exclusive of shoulders, except for approved access gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

503.2.3

Added vehicle load, surface, and exception. Amend as follows:

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus, with a minimum vehicle load of 33,000 pounds per axle and shall be surfaced and paved so as to provide all-weather driving capabilities.

> **Exception:** Temporary access roads serving only buildings under construction shall not be required to be paved.

503.2.4

Added dimensions of turning radius. Amend as follows:

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be no less than 28 feet inside turning radius and 52 feet outside turning radius.

503.2.7

Added grade. Amend as follows:

503.2.7 Grade. The grade of the fire apparatus access road shall not exceed 12 percent.

503.2.8

Defined maximum grade. Amend as follows:

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall have a maximum grade change of 6 percent for 25 feet (7.6 m) before or after the grade change.

503.2.9

New section

503.2.9 Fire Apparatus – Point Load. Fire apparatus access roads including elevated portions shall be designed with a ground bearing capacity not less than 75 psi (500 kPa) over the ground contact area.

503.2.10

New section

503.2.10 Aerial Apparatus Access Roads.

503.2.10.1 Where required. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 ft (9144 mm), *approved* aerial fire apparatus access roads shall be provided. For the purpose 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 a parapet walls, whichever is greater.

503.2.10.2 Proximity to building. One or more of the required access routes meeting this condition shall be located not less than 15 feet (4572 mm) and not greater than 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the *fire code official*.

503.2.10.3 Obstructions. Overhead utility, power lines, trees, carports and canopies shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the *fire code official.*

503.3

Amend as follows:

503.3 Marking. Fire apparatus access roads shall be marked where required to prohibit parking and other obstructions. Marking shall consist of painting the curb, or the side of the street, where no curb is present, with a suitable coat of industrial red enamel along the entire length of road where parking is prohibited. Each section of curb that is painted red shall also be marked by signage stating, "NO PARKING FIRE LANE" (Type A sign). Signs shall be installed in accordance with current Manual on Uniform Traffic Control Devices (MUTCD), Regional Transportation Commission (RTC) uniform standard drawings and specifications and City standards. Signs shall be located at each end of painted curb, and additionally in between so that the maximum separation between signs is 100 feet, as measured along the centerline of the fire apparatus access road.

In lieu of providing multiple signs, where a minimum of one sign is provided at every entrance stating "ON-STREET PARKING IN MARKED FIRE LANES PROHIBITED" (Type B sign), fire lanes may be marked by painting the words "NO PARKING FIRE LANE", over the face of the red-painted curbs (Type C sign). The words on the curbs shall be painted in white letters not less than 4 inches in height with a brush stroke of not less than ¾ inch. The maximum separation between markings shall be 50 feet, as measured along the centerline of the fire apparatus access lane.

503.3.1 Sign Specifications. Where required by the f*ire code official* signs shall be in accordance with the following:
Type A: Minimum dimension of 18 inches (457mm) high by 12 inches (305 mm) wide. Red letters on a reflective white background with 3/8 inch red trim around entire outer edge of sign. Lettering shall be:

"FIRE LANE"

Type B: Minimum dimension of 24 inches (610 mm) wide by 18 inches (457 mm) high. Red letters on reflective white background with 3/8 inch red trim strip around the entire outer edge of sign. Lettering on sign shall be:

"ON_STREET PARKING IN MARKED FIRE LANES PROHIBITED"

Type C: Minimum dimension of 36 inches (914 mm) wide by 4 inches (101 mm) high. White letters on red enamel background. Lettering on curb shall be:

"NO PARKING FIRE LANE"

TYPE A SIGN

TYPE B SIGN

TYPE C SIGN

503.4.1

Amend as follows:

503.4.1 Traffic calming devices. Traffic calming devices shall be prohibited unless *approved* by the *fire code official.*

> **Exception:** Speed humps are allowed on private fire apparatus access roads serving commercial and industrial buildings when *approved* by the *fire code official*. The location(s), the number permitted, and the design of the speed hump(s) shall meet the approval of the *fire code official*.

The *fire code official* is authorized to require the removal from any private property of any existing traffic management or calming device, including speed bumps, that do not meet the applicable criteria, and has been determined by the *fire code official* to unnecessarily hinder emergency apparatus response.

503.6

Sections 503.6.1 – 503.6.6 are new. Amend as follows:

503.6 Access Gates. The installation of access gates across a fire apparatus access road shall be approved by the *fire code official*. Where access gates are installed, they shall have an approved means of emergency operation. The access gates and the emergency operation shall be maintained operational at all times. The minimum clear opening width shall be 20 feet.

503.6.1 Permit. A construction permit is required to install a gate that obstructs a fire apparatus access road in accordance with Section 105.7.12. A separate permit is required for each gated entrance.

503.6.2 General. Fire apparatus access roads that are secured by gates shall comply with the specifications of the Fire Department.

503.6.3 Electronically controlled gates. Electronically controlled gates shall be provided with an approved vehicle detector/receiver system in accordance with the rules and regulations specified by the Fire Department. Access gates shall be maintained operational at all times. When electronically controlled gates are out of service, they

shall be secured in the open position until repairs are complete. Repairs shall be in accordance with original specifications.

> **Exception:** When approved by the *fire code official*, electronically controlled gates that are manned on a 24-hour basis.

When required by the *fire code official*, the installing contractor or the owner of the property shall provide the Fire Department transmitter(s) or approved alternative without cost to the Fire Department.

The *fire code official* may provide transmitter(s), at no cost to the Fire Department, to local law enforcement agencies and/or an ambulance service for use in emergencies.

503.6.4 Existing facilities. All existing facilities with gates installed across access roads shall comply with Fire department guidelines. Non-complying gates shall be secured in the open position in a manner approved by the Fire Department and/or *fire code official*.

> **Exception:** Gates securing sensitive facilities operated by a public utility governed by the Nevada Public Service Commission, a State of Nevada charter, or other public franchise, shall not be required to be secured in the open position.

503.6.5 Plans and Specification. Plans and specifications for fire apparatus access road gates shall be submitted for review and approval prior to construction. Included in the submittal shall be the following information:

1. Site plan with north arrow, roadway, and gate dimensions
2. Location of underground roadway detector loop, and green marker, if applicable
3. Manufacturers' specification sheets detailing the voltage, current, radio frequency, power cable and coding for the proposed system, if applicable
4. Contractor's statement of compatibility with existing installations
5. Detailed vicinity map.

503.6.6 Operational testing. An operational test shall be requested by the installing contractor and shall be conducted prior to placing the system into operation to establish that the final installation complies with this code, the specified design, and is functioning properly.

505.1

Amend as follows:

505.1 Address Identification. New and existing buildings shall have *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. Where required by the *fire code official*, address identification shall be provided in additional *approved* locations to facilitate emergency response. Address identification shall comply with the requirements of the *fire code official* and the ordinances of the jurisdiction. 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.

505.3

New section

505.3 Directory required. When multiple R-2 occupancy buildings are contained in a subdivision and where not all buildings have public street frontage, an approved permanent directory shall be provided at each entrance to the development from surrounding public streets.

507.1

Amend as follows:

507.1 Required water supply. An *approved* water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. The design and installation of both public and private fire hydrants shall be in accordance with this section, Appendix B, Appendix C, NFPA 24 (for private systems) and the Uniform Design and Construction Standards for Potable Water Systems (UDACS)(for public systems). Unless otherwise approved by the *fire code official*, effluent reuse water is not an approved water supply.

507.5.7

New sections 507.5.7 – 507.5.7.3

507.5.7 Painting and Markings. Hydrants and curbs shall be painted, and hydrant locations shall be marked, in accordance with this section.

507.5.7.1 Hydrant Painting. On-site private fire hydrants shall be painted with a suitable prime coat and not less than 2 coats of exterior industrial grade enamel, safety red in color.

507.5.7.2 Curb and Roadside Painting. The curb, or roadside where no curb is present, adjacent to a fire hydrant shall be painted to restrict parked cars from obstructing access to the fire hydrants. A coat of exterior industrial grade enamel, safety red in color, shall be applied for a minimum of 30 feet, 15 feet to each side of the hydrant, unless the curb or roadside is interrupted by a driveway, at which point the paint shall end at the driveway.

507.5.7.3 Lane Marking. Hydrant locations shall be marked by means of a blue colored reflective marker in the fire access lane. The marker shall be located in the center of a drive lane where parking is not anticipated, nearest to the hydrant.

508.1

Added last sentence for secondary response point. Amend as follows:

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 greater than 500,000 square feet (46,452 m^2),* a *fire command center* for fire department operations shall be provided and shall comply with Sections 508.1.1 through 508.1.7. When required, a secondary response point shall comply with Section 508.2.

508.1.6

Amended language in 14. Added 19 – 21. Amend as follows:

508.1.6 Required features. The *fire command* center shall comply with NFPA 72 and shall contain the following features:

1. -13. Unchanged.
14. A new work table with a minimum size of three (3) feet by seven (7) feet capable of holding plans in an open position.
15. – 18. Unchanged.

19. An approved white board with a minimum size of three (3) feet by four (4) feet capable of easy erasure, with a marking device and an eraser attached.

20. Separate shunt trip switches for normal and emergency power.

21. A printer connected to the fire alarm control panel to record all fire alarm, supervisory and trouble signals. The printer shall be connected either to a UPS battery system and/or an emergency power supply.

508.2

New section

508.2 Secondary Response Point. A Secondary Response Point (SRP) shall comply with Section 508.2.1 through 508.2.3.

508.2.1 Where required. When required by the *fire code official*, an SRP shall be provided in buildings/facilities that are required to be served by a *fire command center*.

508.2.2 Components required. The SRP shall have the following components:

1. A fire alarm LCD annunciator that provides a means to scroll through the list of devices that are activated and to acknowledge each alarm. The fire alarm annunciator shall not have the capability of silencing or resetting the building fire alarm system.
2. A microphone capable of providing all-call voice messaging over all notification appliance circuits of the alarm communication system.
3. A pull station capable of evacuating the entire building.
4. An elevator panel that allows the manual transfer of standby power to each elevator cab for all elevators located within the building.

   Exception: Where an elevator panel allowing manual transfer of standby power for all elevators is provided at the *fire command center*, an elevator panel is not required at the SRP.

508.2.3 Location. The SRP shall be located as follows, subject to the approval of the *fire code official*:

1. The SRP shall be located on the floor designated for primary elevator recall.
2. The exterior entrance leading to the SRP shall be adjacent to the fire department vehicle access lane.
3. The SRP shall be located in an area inaccessible to the public.
4. The SRP shall be located within a travel distance of 200 feet from the building entry.
5. The entrance to the SRP shall be separated from the *fire command center* a minimum distance equal to 25% of the building perimeter, or a minimum of 250 feet, as measured along the building perimeter.

510

Amend sections 510.2 – 510.6.5.2 as follows:

510.2 Emergency responder communication coverage in existing buildings. Existing buildings other than Group R-3, that do not have approved in-building, two-way emergency responder communication coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:

1. Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 510.1, Exception I.

2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the in-building, two-way emergency responder communication coverage system is not needed.

510.2.1 Report. Building owners shall submit to the *fire code official* a radio signal strength study, technical opinion and report prepared in accordance with Section 104.8.2. The report shall identify the area(s) requiring an emergency responder communication coverage system to comply with Section 510.4.1

510.3 Permit required. Construction and operational permits for the installation of or modification to emergency responder communication coverage systems and related equipment is required as specified in Sections 105.5.53 and 105.6.4. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.3.1 Construction documents. Construction documents for emergency responder communication coverage systems shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations as determined by the *fire code official*.

510.3.2 Plans. Plans shall be submitted to the *fire code official* for review and *approval* prior to installation. Coordination and compliance with *agency* radio system requirements is the responsibility of the owner and contractor.

510.3.2.1 Plan Submittals. Plan submittals shall include, but not be limited to all of the following:

a. A floor plan that indicates the use of all rooms, emergency responder radio coverage system equipment locations, power panel connections, raceway routing layout, conduit and conductor types and sizes, compliance with survivability criteria and locations of building access to the equipment.
b. A roof plan showing the location of antenna(s) including a line of site plan to agency transmitting and receiving antenna(s).
c. Schematic drawings of the electrical system, backup power, antenna system and other associated equipment.
d. Rack and equipment cabinet plans showing arrangement and configuration of emergency responder radio coverage system equipment.
e. System riser diagram(s).

510.3.2.2 Data sheets. Manufacturer's data sheets shall be provided for equipment to be installed. Manufacturers' data sheets shall indicate model numbers and listing information for equipment, devices, and materials.

510.3.2.3 As-built documents. Any field changes that occur during construction shall be incorporated onto new as-built plans and data sheets. Plans shall be submitted to the *fire code official* and be *approval* prior to final inspections. Coordination and compliance with *agency* radio system as-built document requirements is the responsibility of the owner and contractor.

510.3.3 Licensing. All systems utilizing repeaters shall be FCC licensed under the *agency*'s system. A distributed antenna system (DAS) shall be FCC licensed under the *agency*'s system unless the DAS complies with 47 CFR Part 22.383.

510.3.4 Equipment. Systems and components shall be listed and approved for the purpose for which they are installed.

510.4 Technical requirements. Equipment required to provide in-building; two-way emergency responder communication coverage shall be listed in accordance with UL 2524. The system shall be capable of transmitting all public safety radio frequencies assigned to the *agency's* and be capable of using any modulating technology. Systems, components, and equipment required to provide the emergency responder radio coverage system shall comply with Sections 510.4.1 through 510.4.2.8.

510.4.2 System design. The emergency responder communication coverage system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8, NFPA 70, NFPA 72 and NFPA 1221.

510.4.2.3 Standby power. Emergency responder communication coverage systems shall be provided with dedicated standby batteries or provided with 4-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 emergency responder radio coverage system at 100-percent system capacity for a duration of not less than 24 hours.

510.4.2.5 System monitoring. The emergency responder communication coverage 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:

Items 1 – 8 are u*nchanged.*

9. Supervisory signals required by NFPA 1221.

510.4.2.7 Pathway Survivability. The system shall be designed with a designated pathway survivability as described in NFPA 72 Section 24.3.14 and NFPA 1221 Section 9.6.2. The *fire code official* shall have the authority to require a fire and non-fire risk analysis be prepared to specify and document the pathway survivability design and installation requirements.

510.4.2.8 *Unchanged.*

Exceptions:

1. *Unchanged.*

2. *Unchanged.*

510.4.2.9 Cable.

510.4.2.9.1 Cable shall be contained in a non-combustible raceway, metal-clad, or fully enclosed cable tray system.

Exception: If *approved* by the *fire code official*, where leaky feeder cable is utilized as the antenna, it shall not be required to be installed in metal raceway.

510.4.2.9.2 Cable shall have a passband of 700-900 MHz.

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, permanently affixed 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.

510.6 Maintenance. The emergency responder communication coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.5.

510.6.1 Testing and proof of compliance. The owner of the building or owner's authorized agent shall have the emergency responder communication coverage system shall be 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. *Unchanged.*

2. *Unchanged.*

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. Individual batteries shall be tested in accordance with NFPA 72, Chapter 14.

4. *Unchanged.*

5. 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*. A copy of this report shall also be maintained on-site for three years.

6 The *agency* shall be notified immediately of system impairments in accordance with Appendix P.

510.6.5 Operational Maintenance.

510.6.5.1 Maintenance contract. The owner is responsible for holding a maintenance contract with a company that can provide emergency response 24 hours a day, 7 days a week.

510.6.5.2 Maintenance records. Maintenance records shall be maintained on-site. Copies of all maintenance records shall be submitted to the agency's representatives and the *fire code official* when requested.

604.2

Deleted reference to Chapter 11 and added IEBC. Amend as follows:

604.2 Emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in IEBC. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1. No building security, access control or similar system, shall disable or override any new or existing Phase II emergency operations, preventing access to all levels.

605.1.3

Added last sentence. Amend as follows:

605.1.3 Fuel Oil. The grade of fuel oil used in a burner shall be that for which the burner is *approved* and as stipulated by the oil burner 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 when utilized in equipment *listed and labeled* for use with waste oil and when such equipment is installed in accordance with the manufacturer's instructions and the terms of its listing. For the purposes of this section, the definition of Fuel Oil includes fuels such as diesel that are intended for use in reciprocating internal combustion engines.

605.4.2.3

Changed International to Uniform Mechanical code and added last sentence. Amend as follows:

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, fire pump or generator equipment 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 *Uniform Mechanical Code*. Fuel connections and tank relief vents shall be located on the exterior of the building in approved locations.

606.3.5

New section

606.3.5 Access Panel Coordination. Ducts shall be provided with access panels to facilitate cleaning of automatic sprinklers installed within the duct. Access panels shall be in accordance with the Uniform Mechanical Code

606.3.6

New section

606.3.6 Automatic Sprinkler Location. When automatic sprinkler protection is required, automatic sprinkler head locations shall be coordinated with access panels required by the *Uniform Mechanical Code* such that automatic sprinkler heads are within 3 feet of an access panel.

608.6

Added Uniform Mechanical Code. Amend as follows:

608.6 Access. Access to refrigeration systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code shall be provided for the fire department at all times as required by the *fire code official*.

608.7

Added Uniform Mechanical Code. Amend as follows:

608.7 Testing of equipment. Refrigeration equipment and systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code shall be subject to periodic testing in accordance with Section 608.7.1. Records of tests shall be maintained. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

608.8

Added Uniform Mechanical Code. Amend as follows:

608.8 Emergency signs. Refrigeration units or systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code shall be provided with *approved* emergency signs, charts, and labels in accordance with NFPA 704. Hazard signs shall be in accordance with the *International Mechanical Code* for the classification of refrigerants listed therein.

608.10

Added Uniform Mechanical Code. Amend as follows:

608.10 Remote controls. Where flammable refrigerants are used and compliance with Section 1106.0 of the *Uniform Mechanical Code* is required, remote control of the mechanical equipment and appliances located in the machinery room as required by Sections 608.10.1 and 608.10.2 shall be provided at an approved location immediately outside the machinery room and adjacent to its principal entrance.

608.12

Added Uniform Mechanical Code. Amend as follows:

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 the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code 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.

Exception: *Unchanged.*

806.1.1

Amend as follows:

806.1.1 Restricted occupancies. Natural cut trees shall be prohibited within ambulatory care facilities and Group A, B, E, F, H, I-1, I-2, I-3, I-4, M, R-1, R-2, R-4, and S occupancies.

Exceptions: Trees shall be allowed within dwelling units in Group R-2 occupancies.

807.1

Amended number 3. Amend as follows:

807.1 General. The following requirements shall apply to all occupancies:

1. Unchanged.
2. Unchanged.
3. Furnishings, draperies, hanging fabrics or other objects shall not be placed to obstruct *exits*, access thereto, egress therefrom or visibility thereof, and shall not obstruct fire protection and fire alarm devices and equipment, and shall not restrict the proper operation of such devices.
4. Unchanged.

901.2.2

New section

901.2.2 Plans Complete plans and specification for fire protection systems shall be submitted to the *fire code official* for review and be approved prior to system installation. Approved plans shall be kept readily available on the job site.

The licensee (contractors Master or Qualified Employee) information shall be on submittals as per Nevada Administrative Code, Nevada Revised Statutes, and the Nevada Blue Book.

A designer of fire sprinkler, fire alarm, and special hazard systems shall hold a minimum Level II certification in their respective discipline from the National Institute for Certification in Engineering Technologies (NICET) or an equivalent certification (e.g., plans and calculations prepared by a Nevada Registered Professional Engineer working in their area of expertise). Submittals shall include the designer's printed name, certificate number, and signature.

901.4.7 – 901.4.9

New sections 901.4.8 – 901.4.9. Amend as follows:

Section 901.4.7 Fire pump rooms. Where provided, fire pump rooms shall be designed with adequate space (see NFPA 20 for fire pump clearances and NFPA 70 for working space clearances) for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair, or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump rooms shall be provided with doors and unobstructed passageways large enough to allow removal of the largest piece of equipment.

901.4.7.1 Access. Fire pumps and controllers shall be provided with ready access. Where located in a pump room, the door shall be permitted to be locked provided that the key is available at all times.

901.4.7.2 Marking on access doors. Access doors for fire pump rooms shall be labeled "Fire Pump Room" or "Fire Pump House" with an approved sign. The lettering shall be in contrasting color to the background. Letters shall have a minimum height of 2 inches (51 mm) with a minimum stroke of 3/8 inch (10 mm).

901.4.7.3 Lighting. Permanently installed artificial illumination shall be provided in fire pump rooms.

901.4.8 *Automatic sprinkler system* riser rooms. A dedicated *automatic sprinkler system* riser room shall be required for each fire sprinkler system riser.

Exceptions:

1. Where approved by the *fire code official*, where systems are controlled by wall-mounted Post Indicator Valves (PIV), and where exterior access is provided to the monitoring panel that is located in a conditioned room, an *automatic sprinkler system* riser room is not required.
2. When approved, where a single system serves the building and the system is controlled by a PIV, a riser room is not required.
3. In multi-story facilities, floor control risers are permitted to be located on each floor level in an exit stair enclosure.
4. Systems designed in accordance with Section 903.3.1.3 (NFPA 13D) do not require an *automatic sprinkler system* riser room.
5. Systems designed in accordance with Section 903.3.1.2 (NFPA 13R) shall have an *automatic sprinkler system* riser room/closet that is large enough to facilitate access to all the necessary fire sprinkler and fire alarm valves and devices. This area shall be accessible from the outside with either a door or an access panel large enough to allow for testing and maintenance of system. The area shall also maintain a minimum temperature of 40° F and a maximum temperature of 100° F.
6. Fire pump rooms complying with Section 901.4.7.

901.4.8.1 Contents. The primary *automatic sprinkler system* riser room shall contain the fire riser into the building. The fire riser shall contain at a minimum, a flow switch, a check valve, and a control valve.

> **Exception:** Where there is a single system in the building and an exterior Post Indicator Valve (PIV) is provided, then the control valve is not required in the *automatic sprinkler system* riser room.

901.4.8.2 Exterior Access Door. *Automatic sprinkler system* riser rooms shall have an exterior access door with a minimum width of 36 inches (914 mm) and a minimum height of 80 inches (2032 mm)

> **Exception**: For high-rise, terminal, and covered mall buildings, secondary fire risers may be contained in *automatic sprinkler system* riser rooms that are located in dedicated rooms as *approved* by the *fire code official* in areas without direct access from the exterior.

901.4.8.3 Protection. *Automatic sprinkler system* riser rooms shall be separated from the rest of the building by 1-hour fire partitions.

901.4.8.4 Size. The riser room shall have a minimum area of 16 square feet (1.49 m^2), with a minimum dimension of 4 feet for the first sprinkler riser plus an additional 9 square feet for each additional riser contained.

901.4.8.5 Clearances for a fire alarm control unit. Where a fire alarm control unit is located in the *Automatic sprinkler system* riser room, the unit shall be located so that there is a minimum clearance in accordance with the electrical code.

901.4.8.6 Auxiliary control valves. *Automatic sprinkler system* riser rooms are not required for auxiliary control valves.

901.4.8.7 Signage. Weatherproof signage shall be provided on the exterior access door. Signage shall state "Fire Sprinkler Riser Room" in a contrasting color. Letters shall have a minimum height of 2 inches with a minimum stroke of 3/8 inch.

901.4.9 Environment. *Automatic sprinkler system* riser rooms and fire pump rooms shall be maintained at a temperature of not less than 40° F and a maximum temperature of 100° F. Heating and cooling units shall be permanently installed.

Exceptions:

1. Where the fire sprinkler riser room or fire pump room does not contain a Fire Alarm/Monitoring Panel or spare sprinklers heads, or when these devices are rated for higher ambient temperatures the room shall not be required to be conditioned for maximum temperature.
2. Heating and/or conditioning is not required if calculations are prepared and sealed by a design professional, on a case-by case address specific basis, proving that the temperature within the riser room does not fall or rise below the temperature range of 40° F to 100° F. To maintain 40° F, the temperature analysis must use a starting temperature of 50° F and use an outside temperature of 0° F for a period of 8 hours. To maintain 100° F, the temperature analysis must use a starting temperature of 90° F and use an outside temperature of 120° F for a period of 8 hours.
3. Where the fire sprinkler riser room or fire pump room contains equipment that has a higher manufacturer's temperature rating acceptable to the *fire code official*.

901.10

Added construction permit. Amend as follows:

901.10 Recall of fire protection components. Any *fire protection system* component regulated by this code that is the subject of a voluntary or mandatory recall under federal law shall be replaced with *approved*, *listed* components in compliance with the referenced standards of this code. A construction permit shall be obtained for the replacement of all recalled components.

903.1.1

Delete Section **903.1.1 Alternative protection.**

903.2

Amend as follows:

903.2 Where required. Approved *automatic sprinkler system*s in new buildings and structures shall be provided throughout all buildings and structures, regardless of occupancy type and including buildings and structures in accordance with the *International Residential Code*, which meet one of the following requirements, and additionally in the locations described in Sections 903.2.1 through 903.2.12:

1. For buildings constructed in accordance with the International Building Code, approved automatic sprinklers systems are required where the building area exceeds 5,000 square feet (464 m^2).
2. For buildings constructed in accordance with the *International Residential Code*, approved *automatic sprinkler system*s are required.
3. For any buildings, not otherwise requiring fire sprinklers, where the available fire flow does not meet the fire flow requirements of this code, approved *automatic sprinkler system*s shall be provided as required by the *fire code official*.

Exceptions:

1. Open parking garages with no other occupancy above the open parking garage structure and with fire apparatus lanes immediately adjacent to two open sides of the garage equaling a minimum of 40% of the garage perimeter are not required to be protected with automatic sprinklers.
2. Automatic sprinklers shall not be required in buildings or structures used exclusively for agricultural, livestock, or equestrian activities, with or without spectators, where structures may cover the use, including the spectator area, provided the use is not enclosed with any walls along any portion of the perimeter of the structures, except for rooms containing code-required building service components, and provided that the minimum clear height along the entire perimeter of the structure is 7 feet 6 inches (2286 mm).
3. Buildings, structures, or service equipment and installations directly used in utility generation or distribution which are installed on properly recorded easements belonging to water, gas, power, telephone, or other utility companies that are preemptively regulated by the Nevada Public Service Committee, a State of Nevada charter, or other public franchise. This exception does not apply to non-exempted buildings or structures containing occupiable spaces such as offices, meeting rooms, service counters, public restrooms, or other normally occupied spaces.
4. Playground shade structures, fuel dispensing canopies, and carports open to a minimum clear height of 10 feet on all sides around the entire perimeter, with non-combustible structural support and frame, with either non-combustible material, or fabric complying with NFPA 701 providing shade, located a minimum of 10 feet from the nearest building, property line or shade structure, and less than 10,000 square feet in projected area, do not require fire sprinklers.
5. For new construction expanding existing unsprinklered Group R-3 buildings or one- and two-family dwellings built in accordance with the *International Residential Code*, sprinklers are not required to be retrofitted into the building where the building is provided with fire flow in accordance with Appendix B and the newly added living space does not exceed 5,000 square feet.

If any fire area in a building or structure is provided with fire sprinklers, whether required or not, all fire areas in the building or structure shall be provided with fire sprinklers:

Exceptions:

1. Where a building is subdivided into separate buildings, each having a total building area of less than 5,000 sq ft (464 m^2), by fire walls with no openings constructed in accordance with the International Building Code.
2. Special hazard areas that required sprinklers for certain uses, such as medical gas rooms, may be fire sprinklered without requiring additional fire sprinklers throughout the building, when approved by the *fire code official*.

903.2.3

Amend as follows:

903.2.3 Group E. An *automatic sprinkler* system shall be provided for Group E occupancies where one of the following conditions exists:

1. Throughout all Group E *fire areas* greater than 5,000 square feet (464m²) in area.
2. The Group E fire area is located on a floor other than a level of exit discharge serving such occupancies.
   Exception: In buildings where every classroom has not fewer than one exterior exit door at ground level, an automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area
3. The Group E Fire area has an occupant load of 300 or more.
4. Daycare facilities where there is occupancy from 12:00 AM - 6:00 AM and care for 7 or more children.

903.2.11.5

Added duct length. Amend as follows:

903.2.11.5 Commercial cooking operations. An *automatic sprinkler system* shall be installed in a commercial kitchen exhaust hood and duct system where an *automatic sprinkler system* is used to comply with Section 904, and for the entire length of duct when the duct length exceeds 75 feet.

903.2.11.7

New section

903.2.11.7. Protection of available storage height. In Group S-1 and all other storage areas the fire sprinkler system shall be designed to protect storage up to the maximum available storage height. The minimum sprinkler density shall be equivalent to that required for a Class IV commodity pursuant to NFPA 13.

903.3.1.1.1

Amend as follows:

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

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

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

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

4. 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*.

903.3.1.2

Changed base code from four stories to two stories. Amend as follows:

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies shall be permitted to be installed throughout in accordance with NFPA 13R where the Group R occupancy meets all of the following conditions:

1. Two stories or fewer above *grade plane*.

2. The floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

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 in Group R occupancies constructed in accordance with Section 510.2 and 510.4 of the International Building Code shall be measured from grade plane.

903.3.5.3

New section

903.3.5.3 Cross connections and backflow, minimum types of protection. Sprinkler systems defined as Class 4, Class 5, and Class 6 fire sprinkler systems by NAC 445A, shall require approval from the water purveyor prior to system installation.

903.4

Amended language in exception 6. Amend as follows:

903.4 Sprinkler system supervision and alarms. 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 sprinklers systems* protecting one- and two-family dwellings.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. *Automatic sprinklers 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 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

Edited language for exceptions and all verbiage after. Amend as follows:

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

Exceptions:

1. Underground key or hub valves are not required to be monitored.
2. Backflow prevention devices located at the municipal water supply connection are not required to be monitored when either locked in the open position or are located within an underground vault or an approved insulated enclosure.

Multi-story facilities shall provide zone annunciation on a floor-by-floor basis.
In occupancies provided with a supervised sprinkler system, the following three distinctly different signals shall be transmitted to an approved supervising station:

1. Water Flow Alarm
2. Supervisory
3. System Trouble

The supervising station shall only retransmit Water Flow Alarm signals to the Fire Department.

903.4.2

Amend including new subsection as follows:

903.4.2 Audible and Visual Notification appliances. *Approved* audible and visual notification appliances shall be connected to each *automatic sprinkler system*. Such sprinkler waterflow alarm notification appliances shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. An exterior audible and visual waterflow notification appliance shall be provided on the exterior of the building above the wall-mounted Fire Department Connection. One interior audible and visual notification appliance shall be provided near the main entrance or in a normally occupied location. In multiple-tenant facilities, one interior audible and visual notification appliance shall be provided near the main entrance or in a normally occupied location for each tenant space. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

> **903.4.2.1 Audible and visual notification appliances in *self-storage service facilities (mini-storage).*** Audible and visual notification appliances in *self-storage service facilities (mini-storage)* shall be connected to a dedicated function fire alarm control panel and shall be located throughout interior corridors and common use spaces in accordance with section 907.5.

903.4.3

Removed high-rise buildings. Amend as follows:

903.4.3 Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in multi-story facilities.

903.4.4

New section.

903.4.4 Tenant isolation control valves. *Approved* isolation control valves shall be provided for Group A and M tenant spaces having public access exclusively to an adjacent assembly space or mall. Immediately adjacent tenant spaces may be combined up to a gross area of 5,200 square feet. This isolation control valve shall not define a separate sprinkler system. It shall be required in new construction and in existing buildings with a change of occupancy or construction affecting 20 or more sprinklers.

903.6

Removed reference to Chapter 11 as previously deleted (903.6) Remainder is new. Amend as follows:

903.6 Where required in existing buildings and structures. *Automatic sprinkler system*s in accordance with Section 903 and designed per the Fire Code shall be provided in unsprinklered *existing structure*s at the locations described in Sections 903.6.1 through 903.6.3.2.

Where these provisions result in partially sprinklered buildings, durable weatherproof signage shall be provided at the Fire Department Connection(s) clearly indicating that the building is partially protected with fire sprinklers and clearly identifying the portion(s) of the building covered by the fire sprinkler systems.

Where required by the *fire code official*, the underground fire service and fire sprinkler lead-in to the first portion of an existing unsprinklered building shall be sized to a minimum Ordinary Hazard Group II sprinkler design for future expansion of the fire sprinkler system to cover all other portions of the building.

903.6.1 Additions. Additions to any building shall comply with this Section and the *International Existing Building Code*.

903.6.1.1 Sprinklered Addition. In existing unsprinklered buildings where sprinklers are provided for a building addition, whether required or not, the entire building shall be sprinklered.

Exceptions:

1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area of the addition where the addition fire area is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the International Building Code, and without openings.

2. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

903.6.1.2 Unsprinklered Addition. In existing unsprinklered buildings where sprinklers are not otherwise required or provided in the building addition, the remainder of the building is not required to be provided with sprinklers where any of the following conditions are met:

1. The building has a total area of less than 5,000 sq ft (464 m^2) and the addition does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.

2. In other than Group H occupancies, the *fire area* containing the addition is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.

903.6.2 Alterations. Alterations within existing building shall comply with this Section and the *International Existing Building Code*.

903.6.2.1 Sprinklered Alterations. In existing unsprinklered buildings where sprinklers are provided for an alteration, whether required or not, the entire building shall be sprinklered.

Exceptions:

1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the alteration where it is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.

2. When approved by the *fire code official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

903.6.2.2 Unsprinklered Alterations. In existing unsprinklered buildings where sprinklers are not otherwise required or provided in the alteration, the remainder of the building is not required to be provided with sprinklers due to the alteration.

903.6.3 Change of Occupancy. A change of occupancy within an existing building shall comply with this Section and the *International Existing Building Code*.

903.6.3.1 Sprinklered Change of Occupancy. In existing unsprinklered buildings where sprinklers are provided for an area containing a change of occupancy, whether required or not, the entire building shall be sprinklered.

Exceptions:

1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the change of occupancy where it is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.

2. When approved by the *fire code official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

903.6.3.2 Unsprinklered Change of Occupancy. In existing unsprinklered buildings where sprinklers are not otherwise required or provided in the change of occupancy, the remainder of the building is not required to be provided with sprinklers where any of the following conditions are met:

1. The building has a total area of less than 5,000 sq ft (464 m^2) and the change of occupancy does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.

2. In other than Group H occupancies, the *fire area* containing the change of occupancy is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707, and without openings.

3. When approved by the *building official and fire code official*, a change in occupancy to an equal or lesser hazard shall not require the installation of sprinklers for any part of the building. To make such a determination, the *building official and fire code official* may consider changes in occupant load, relative fire hazard and other relevant data.

904.2

Removed installed as an alternative to the required automatic sprinkler system. Amend as follows:

904.2 Where permitted. Automatic fire-extinguishing systems shall be approved by the *fire code official*.

904.13.5.2

Amended qualified individuals to licensed by the State of Nevada Fire Marshal's Office. Amend as follows:

904.13.5.2 Extinguishing system service. Automatic fire-extinguishing systems shall be serviced not less frequently than every 6 months and after activation of the system. Inspection shall be conducted by personnel licensed by the State of Nevada Fire Marshal's Office and a certificate of inspection shall be kept on site and shall be readily available to the *fire code official*.

905.3

New language after the exception. Amend as follows:

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 system*s.

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

The standpipe design shall be *approved* by the *fire code official*. Standpipes in buildings with fire pumps shall be automatic. Standpipes in buildings not subject to freezing shall be wet. Standpipes in areas subject to freezing shall be permitted to be manual dry when equipped with both KNOX locking caps and/or KNOX plugs for fire department connections (FDC) and hose valves that are acceptable to the *fire chief*.

905.3.1

Changed standpipe class from III to I. Amend as follows:

905.3.1 Height. Approved Class I 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 the fire department vehicle access.

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

1. Recessed loading docks for four vehicles or less, and
2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

905.3.3

Amended number 5. Amend as follows:

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

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within interior exit stairways opening directly on the mall.
3. At exterior public entrances to the mall of a *covered mall building*.
4. At public entrances at the perimeter line of an *open mall building*.
5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 100 feet (30 480 mm) of hose and 30-foot (9144 mm) of stream from a hose connection. The length of hose shall be measured along normal walking routes, and the stream shall not be expected to penetrate walls or windows.

905.3.9

New section

905.3.9 Building area. When required by the *fire code official*, buildings in excess of 10,000 square feet (929 m^2) in area per level shall be equipped with a Class I standpipe system where any portion of the building's interior area is more than 200 feet (60,960 mm) measured vertically and horizontally from the nearest point of fire department apparatus access.

905.4

Amended 6, everything prior to is base code. Amend as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connection shall be provided in all of the following locations:

1. In every required interior 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* 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 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 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. Throughout the entire building so that all portions of each floor level are provided with hose valve coverage utilizing 100 feet (30 480 mm) of hose and 30-foot (9144 mm) stream from any hose connection located on that floor or intermediate landing. The length of hose shall be measured along normal walking routes, and the stream shall not be expected to penetrate walls or windows.

905.4.1

Amended exception to include construction type. Amend as follows:

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

Exception: In buildings constructed of Type I or Type II construction in accordance with the Building Code or in buildings equipped throughout with an approved *automatic sprinkler system*, standpipe laterals and vertical risers that are not located within an interior exit stairway are not required to be enclosed within fire-resistance-rated construction.

905.9

Removed exception 2. Amend as follows:

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

Exceptions:

1. Valves to underground key or hub valves do not require supervision.

906.2

Changed maintenance schedule to annual. Amend as follows:

906.2 General requirements. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

Exceptions:

1. The travel distance to reach an extinguisher shall not apply to spectator seating portions of Group A-5 occupancies.
2. Thirty-day inspections shall not be required, and maintenance shall be performed annually for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a listed and approved electronic monitoring device, provided that all of the following conditions are met:
    - 2.1 Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.
    - 2.2 Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
    - 2.3 The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
    - 2.4 Electronic monitoring devices and supervisory circuits shall be tested annually when extinguisher maintenance is performed.
    - 2.5 A written log of required hydrostatic test dates for extinguishers shall be maintained by the owner to ensure that hydrostatic tests are conducted at the frequency required by NFPA 10.
3. In Group I-3 occupancies, portable fire extinguishers shall be permitted to be located at staff locations.

907.1

Amend as follows:

907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.9 are applicable to existing buildings and structures. A separate fire alarm control unit is required for each separate building. A campus system shall not substitute the requirement for a separate fire alarm control unit for each separate building. Campus systems may be allowed subject to the approval of the *fire code official*. When approved by the *fire code official* campus systems circuits shall utilize Class X circuits with weatherproof raceways.

907.1.4

New section

907.1.4 Signage. A “FIRE ALARM CONTROL PANEL” sign shall be provided in minimum 2 inch letters with a minimum 3/8 inch stroke. The color of the letters shall be contrasting with respect to the background. The sign shall be provided on the door leading to the fire alarm control panel(s), unless otherwise approved by the *fire code official*.

907.2

Amend as follows:

907.2 Where required-new buildings and structures. An *approved* fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

In separated mixed-use occupancy buildings, the fire alarm/detection system shall be limited to the *fire area* that requires the system. In non-separated mixed-use occupancy buildings containing an occupancy with a fire alarm/detection system the system is required to be extended throughout the building or *fire area*.
A fire alarm system shall be installed throughout all buildings three or more stories in height.

Exception: Group R-3 occupancies and single-family dwellings built under the *International Residential Code*.

Not fewer than one manual fire alarm box shall be provided in an *approved* location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box shall not be installed for fire alarm systems dedicated to elevator recall control and supervisory service.

907.2.7.1

Delete Section 907.2.7.1 Occupant notification

907.2.9.1

Changed dwelling units/sleeping units from 16 to 15. Amend as follows:

907.2.9.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies where any of the following conditions apply:

1. Any *dwelling unit* or *sleeping unit* is located three or more stories above the lowest *level of exit discharge*:
2. Any *dwelling unit* or *sleeping unit* is located more than one story below the highest *level of exit discharge* of *exits* serving the *dwelling unit* or *sleeping unit*; or
3. The building contains 15 or more *dwelling units* or *sleeping units*.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
   2.1 At least one manual fire alarm box is installed at an approved location.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means or egress door

opening directly to an exterior exit access that leads directly to exits or are served by open-ended corridors designed in accordance with Section 1027.6, Exception 3.

907.2.9.1.1

New section

907.2.9.1.1 Automatic smoke detection system. When a fire alarm system is required, 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. For the purposes of this section, interior means a conditioned space.

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

907.2.11

Amend as follows:

907.2.11 Single- and multiple-station smoke alarms. Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.7, 907.5 and NFPA 72.

907.2.11.6

Amend as follows:

907.2.11.6 Power source. In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery' backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system in accordance with Section 1203. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system that complies with Section 603.
2. Smoke detectors with 520-Hz sounders complying with 907.5.2.1.3.2.

907.2.13

Exceptions changed. Amend as follows:

907.2.13 High-rise buildings. High-rise buildings shall be provided with an automatic smoke detection system in accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
3. Unenclosed portions of buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.

907.2.13.1.3

New section

907.2.13.1.3 System smoke detection with sounder bases. In a new structure classified as a high-rise building with residential occupancies, in lieu of installing stand-alone smoke alarms, system-type analog addressable smoke detectors with sounder-bases shall be installed in all locations required by Section 907.2.11. Activation of said devices shall send a supervisory alarm signal to the building fire alarm control panel. The smoke detector sounder shall only sound within the individual dwelling unit, suite of rooms, or similar area and shall not actuate the building fire alarm system, unless otherwise permitted by the *fire code official*.

907.2.13.2

Amend as follows:

907.2.13.2 Fire department communication system. Where a wired communication system is provided in addition to a radio coverage system in accordance with Section 510, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 using warden stations 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* and other locations as required by the *fire code official*. The fire department communication device shall be provided at each floor level within the interior *exit stairway*.

907.2.13.3

Removed occupied floor requirement. Amend as follows:

907.2.13.3 Multi-channel voice evacuation. Voice evacuation systems for high-rise buildings shall be multi-channel systems.

907.2.13.4

New section

907.2.13.4 Reliability. If a networked fire alarm system is installed, and if the fire alarm network nodes are interconnected utilizing physical conductors (e.g., metallic, optical fiber), the network nodes shall be interfaced with each other utilizing Class X wiring methods. The outgoing and return conductors shall not be run in the same cable assembly, enclosure, or raceway.

907.2.24

New section

907.2.24 Child-care smoke detectors. System smoke detectors shall be installed within sleeping areas of day care facilities.

Exception: Single-station smoke alarms may be permitted in facilities not otherwise required to be provided with a fire alarm system.

907.4.1

Added exception 2. Amend as follows:

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

Exceptions:

1. Where ambient conditions prohibit installation of smoke detector, a heat detector shall be permitted.
2. Dedicated function sprinkler monitoring systems shall not be required to have smoke detectors installed above the dedicated function control unit.

907.4.2

Added dual action. Amend as follows:

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

907.5

Amend as follows:

907.5 Occupant notification. 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 Group R-l and R-2 occupancies shall comply with Section 907.5.2.1.3.2.

Exception: Group R-1 and R-2 occupancies not provided with a fire alarm system.

907.5.2.1.1

Added minimum sound pressure and exceptions. Amend as follows:

907.5.2.1.1 Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (15 dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupiable space within the building. The minimum sound pressure levels shall be: 90 dBA in mechanical equipment rooms; and 80 dBA in other occupancies. Audible notification appliances shall be installed in each occupiable space.

Exceptions:

1. Laundry rooms, walk-in closets, storage rooms and walk-in coolers/freezers equal to or less than 100 square feet (9.29 m^2) in floor area.
2. In lieu of showing an audible notification appliance within a specific occupiable space on the plans, calculations may be provided showing that the alarm signals from the adjacent audible appliances will achieve a minimum of 80 decibels inside and throughout that space, where doors or other barriers between the space and the adjacent audibility device(s) are closed. Sound pressure levels shall be measured during system acceptance testing to verify the calculated space achieves a minimum of 80 dBA.
3. In sleeping areas required to be protected with low-frequency alarms, the 80 dBA minimum sound pressure provision is not required where a listed fire alarm device is not available to simultaneously achieve both the low-frequency signal and the 80 dBA minimum sound pressure.

907.5.2.3.1

Amended exceptions. Amend as follows:

907.5.2.3.1 Public use areas and common use areas. Visible alarm notification appliances shall be provided in public use areas and common use areas.

Exceptions:

1. Electrical and mechanical rooms that are not normally occupied or less than 400 square feet.
2. Janitor closets.
3. Storage rooms less than 400 square feet.
4. Exit enclosures.
5. Individual work areas or offices and private toilets serving individual work areas or offices.
6. Individual inmate sleeping areas and patient sleeping rooms.

907.5.2.2.6

New sections

907.5.2.2.6 Intelligibility. Emergency voice/alarm communication system plan submittals to the *fire code official* shall indicate graphically and in tabular form each acoustically distinguishable space (ADS) as described in NFPA 72 Annex D. ADS where intelligibility is required shall be designated. ADS that require intelligibility testing shall be designated.

907.5.2.2.6.1 Intelligibility Acceptability Criteria. Where intelligibility testing is required, 90 percent of the measurement locations within each ADS shall have a measured Speech Transmission Index (STI) of not less than 0.50 (0.70 Common Intelligibility Scale (CIS)) and an average STI of not less than 0.55 (0.74 CIS). The relationship between STI, CIS and Intelligibility is shown on Table 907.5.2.2.6.1.

Table 907.5.2.2.6.1

STI Score	CIS Equivalent	Intelligibility
0.00	0.00	Bad
0.05	0.00	Bad
0.10	0.00	Bad
0.15	0.18	Bad
0.20	0.30	Bad
0.25	0.40	Bad
0.30	0.48	Bad
0.35	0.54	Poor
0.40	0.60	Poor
0.45	0.65	Poor
0.50	0.70	Fair
0.55	0.74	Fair
0.60	0.78	Fair
0.65	0.81	Good
0.70	0.85	Good
0.75	0.88	Good
0.80	0.90	Excellent
0.85	0.93	Excellent
0.90	0.95	Excellent
0.95	0.98	Excellent
1.00	1.00	Excellent

907.5.2.2.6.2 Intelligibility Testing. Where intelligibility testing is required, intelligibility shall be determined through quantitative measurements.

907.5.2.2.6.3 Quantitative measurements within acoustically distinguishable space shall use pink noise or an approved signal source. Testing using any of the voice alarm emergency evacuation messages is prohibited.

907.6.4.1

Changed section from Zoning indicator panel to Alarm Annunciator and Fire Alarm Control Unit. Entire language is new. Amend as follows:

907.6.4.1 Alarm Annunciator and Fire Alarm Control Unit. Alarm annunciators and fire alarm control units shall comply with all of the following:

1. If a building has a main entrance/foyer and has more than one story, a read-only remote annunciator shall be provided inside the building at the main entrance/foyer.
   Exceptions:
   1. High-rise buildings provided with a fire command center.
   2. Alternate location as approved by the *fire code official*.
2. If a building has a fire riser room with an exterior door, the fire alarm control unit shall be provided within the fire riser room.
   Exceptions:
   1. High-rise buildings provided with a fire command center.
   2. Alternate location as approved by the *fire code official*.
3. The location of an operated initiating device shall be displayed by alphanumeric display at the annunciator.
4. The alphanumeric display shall state the device type, the floor level (if applicable), the device address and a descriptive location for the operated device(s).

5. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

907.6.6

New language for home care facilities and proprietary supervising station systems. Language after exceptions is new. Amend as follows:

907.6.6 Monitoring. Fire alarm systems required by this chapter or by the *International Building Code* shall be monitored by an *approved* supervising station in accordance with NFPA 72 and as *approved* by the *fire code official*. Home care facilities that are licensed by the State of Nevada are also required to be monitored per this section. Proprietary Supervising Station Systems (also called self-monitoring systems), when allowed by the *fire code official*, shall be in accordance with the IFC and NFPA 72.

> **Exception:** Monitoring by a supervising station is not permitted unless specifically approved by the *fire code official* for:
> 1. Single- and multiple station smoke alarms required by Section 907.2.10.
> 2. *Automatic sprinkler systems* in one- and two-family dwellings.
> 3. Monitoring systems utilizing point-by-point monitoring.

In occupancies provided with a fire alarm system, the following four distinctly different alarm signals shall be transmitted to an approved supervising station:

1. Water Flow Alarm, if provided with a fire sprinkler system.
2. Fire Alarm.
3. System Trouble.
4. Supervisory, when applicable.

For new and existing facilities, the supervising station shall only retransmit Water Flow Alarm signals to the Fire Department.

> **EXCEPTION:** The supervising station shall also retransmit fire alarm signals for government buildings, (all facilities owned, leased and/or operated by any City, County, State, or Federal government agency) schools (including daycares, preschools, public and private schools etc.) and hospitals (including nursing homes,

convalescent homes, adult care facilities, group homes, extended care facilities, assisted living facility, etc.).

907.6.6.2

Revise section as follows:

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 *for commercial buildings. It may be permitted for one- and two- family dwellings when approved* by the *fire code official*.

907.6.6.4

New section

907.6.6.4 Control units. Unless otherwise approved, not more than one main or master fire alarm control unit shall be permitted per building, in an approved location. Unless otherwise approved, not more than one monitoring panel shall be permitted per building.

907.6.7

New Section

907.6.7 Connections to other systems. A fire alarm system shall not be used for any purpose other than fire warning unless approved by the *fire code official*. Interconnections to other systems shall be listed for compatibility or approved by the *fire code official*.

907.8

Language after first paragraph is new. Amend as follows:

907.8 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Sections 907.8.1 through 907.8.4 and NFPA 72. Records of inspection, testing and maintenance shall be maintained.

All fire alarm systems shall be tested and inspected in accordance with nationally recognized standards and the State of Nevada Fire Marshals' Regulations. The alarm contractor shall also provide proof of a license to do business within the *fire code official's* area. A maintenance contract from an approved fire alarm company is required.

Inspection reports shall be kept on-site and shall be readily available to the inspection authority. A copy of inspection reports containing deficiencies shall be mailed to the *fire code official* within 48 hours, only when the owner or occupant has been notified of a discrepancy(s) and fails to correct the discrepancy(s) within 30 days whenever any deficiency of the system or violation of the Fire Code is noted.

Prior to service or testing of any equipment, the Fire Department's Dispatch Center shall be notified of the location of the test and the approximate time that the equipment will be inoperable. Upon the completion of the test and inspection, the Fire Department Dispatch Center shall be notified that the system is operable.
In the event a service/maintenance contract is canceled or not renewed, the *fire code official* shall be notified by the service company within 24 hours.

907.11

New section

907.11 Fire Alarm Systems in Existing Buildings. Fire alarm systems, installed in accordance with Section 907 and the Fire Code, shall be provided in *existing structures* at the locations described in Sections 907.11.1 through 907.11.3.

907.11.1 Additions. Additions to any building shall comply with this Section and the *International Existing Building Code*. In existing buildings where fire alarms are provided for the addition, whether required or not, coverage shall be extended to include the entire building.

> **Exception:** In other than Group H occupancies, fire alarm system coverage is not required beyond the *fire area* containing the addition where the addition *fire area* is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, with openings protected with automatic-closing devices.

907.11.2 Alterations. Existing buildings that undergo an alteration shall comply with this Section and the *International Existing Building Code*.

> **Exception:** Alterations consisting solely of the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.

In existing buildings where fire alarms are provided for an alteration, whether required or not, coverage shall be extended to include the entire building.

> **Exception:** In other than Group H occupancies, fire alarm system coverage is not required beyond the *fire area* containing the alteration where the alteration fire area is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and with openings protected with automatic-closing devices.

907.11.3 Change of Occupancy. Existing buildings that undergo a change of occupancy shall comply with this Section and the *International Existing Building Code*.

> **Exception:** When approved by the *building official*, a change in occupancy to an equal or lesser hazard shall not require the installation of a fire alarm system for any part of the building. To make such a determination, the *building official* may consider changes in occupant load, relative fire hazard and other relevant data.

In existing buildings where fire alarms are provided for a change of occupancy, whether required or not, coverage shall be extended to include the entire building.

> **Exception: I**n other than Group H occupancies, fire alarm system coverage is not required beyond the fire area containing the change of occupancy where the change of occupancy fire area is separated from the reminder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code,* with openings protected with automatic-closing devices.

909.5.3

Amend as follows:

909.5.3 Opening protection. Openings in *smoke barriers* shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by *fire door assemblies* complying with Section 716 of the *International Building Code*.

Exceptions:

1. *Unchanged.*
2. *Unchanged.*
3. *Unchanged.*
4. *Unchanged.*
5. *Unchanged.*
6. *Unchanged.*
7. Door openings in *smoke barriers* shall be permitted to be protected by *self-closing* fire doors in the following locations:
    - 7.1 Guest rooms.
    - 7.2 Individual dwelling units.
    - 7.3 Mechanical rooms.
    - 7.4 Elevator machine rooms.
    - 7.5 Electrical rooms used exclusively for that purpose.
    - 7.6 Doors typically maintained in a closed position as approved by the *Building Official*.

909.16

Amend as follows

909.16 Fire fighter's smoke control panel. An *approved* fire fighter's smoke control panel for fire department emergency response purposes only shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. The panel shall be located in a *fire command center* complying with Section 508 in high-rise buildings or buildings with smoke-protected assembly seating. In all other buildings, the fire fighter's smoke control panel shall be installed in an *approved* location adjacent to the fire alarm control panel. The fire fighter's smoke control panel shall comply with Sections 909.16.1 through 909.16.3 as required by the *fire code official.*

909.18.8.3

Amend as follows:

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

> I have reviewed this report and by personal knowledge and on-site observation certify that the smoke-control system is in substantial compliance with the design intent, and to the best of my understanding complies with requirements of the code.
>
> **909.18.8.3.1 Report filing.** A copy of the final report shall be filed with the responsible *code official* and an identical copy shall be maintained in an approved location at the building.

909.18.10

New section

909.18.10 Alternative testing method. When required by the *Code official*, theatrical smoke or other approved tracer gases shall be used during final acceptance testing to visually verify air movement.

909.20.5.1

New section

909.20.5.1 Dampered relief opening. A controlled relief vent capable of discharging a minimum of 2,500 cfm (1180 L/s) of air at the design pressure difference shall be located in the upper portion of the pressurized stair enclosure.

909.22

Amend as follows:

909.22 Maintenance. Smoke control systems shall be always maintained in an operable condition to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. Inspection and periodic testing of existing smoke control systems shall be performed in accordance with the Southern Nevada Fire Code Committee's Uniform Guideline for smoke control testing & recertification, the manufacturer's instructions, and Sections 909.22.1 through 909.22.6.

909.22.4

Amend as follows:

909.22.4 Dedicated smoke control systems. Dedicated smoke control systems shall be operated for each control sequence semiannually. When required by the *fire code official*, the system shall also be tested under standby power conditions.

909.22.5

Amend as follows:

909.22.5 Non-dedicated smoke control systems. Non-dedicated smoke control systems shall be operated for each control sequence annually. When required by the *fire code official*, the system shall also be tested under standby power conditions.

912.1.1

New section

912.1.1 Required sizes. *Automatic sprinkler system*s with a demand of up to 500 gpm shall be installed with a siamese with two 2½-inch. (65 mm) inlets. When the system demand exceeds 175 psi, the system shall include one 2½-inch (65 mm) inlet per every 250 gpm (956 L/min) demand (maximum of 4 inlets). Modifications or alternate designs shall be *approved* by the *fire code official*.

Fire department connection piping shall be a minimum of 4-inch (100 mm) for three or fewer inlets, a minimum of 6 in (150 mm) for four inlets and shall have a diameter equal or greater to the largest supply main.

912.4.2

Amend as follows:

912.4.2 Clear space around connections. A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height not including any doors or windows, shall be provided and

maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or *approved* by the *fire code official.*

Exception: The FDC may be permitted within 36 inches of the fire riser room door opening if it is mounted on the opposite side of the hinges.

913.1.1

New section

913.1.1 Redundant pumps in high-rise structures. Where pumps are used in structures with an occupied floor or occupied roof greater than 250 feet (76 m) in height above the lowest level of fire department access, a redundant fire pump shall be provided for each required fire pump.

913.1.2

New section

913.1.2 Redundant pumps in multiple structures. Where a fire pump is used for booster pressure supply to multiple structures, a redundant fire pump shall be provided for each required fire pump.

913.2.3

New section

913.2.3 Drains. Floor drains having a minimum diameter of 3 inches shall be provided in the fire pump room.

914.3.1

Amended exception. Amend as follows:

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 *open parking garages* in accordance with Section 406.5 of the International Building Code.

914.3.2

New section after secondary water supply. Added dedicated supply and usable gallons, removed Seismic Design categories. Amend as follows:

914.3.2 Secondary water supply. An automatic dedicated secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream allowance required by NFPA 13, but not less than 15,000 usable gallons, shall be provided for high-rise buildings. 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.

914.3.2.1 Design options. Secondary water tanks that intercept the municipal water supply shall be designed to allow for continued fire protection when the secondary tank is taken out of service.
a. For secondary water tanks supplying horizontal split case fire pump(s), or other fire pump(s) that can take a piped water supply, a bypass shall be installed around the secondary water tank to allow for temporary supply to the fire protection system during the repair of the secondary water tank.
b. For secondary water tanks supplying vertical turbine pump(s), or other fire pump(s) that cannot accept piped supply, the secondary water supply shall be split into two separate tanks, each not less than ½ of the required

water capacity, interconnected by pipe with sectional valves, with redundant pumping and automatic water filling capabilities. This tank arrangement shall be such as to permit one of the two tanks to be drained and have maintenance performed, while maintaining an operational fire protection system for the building served
c. Alternate engineered solution that provides a water supply while the secondary tank is out of service approved by the *fire code official.*

914.4.1

Removed exceptions. Amend as follows:

914.4.1 ***Automatic sprinkler system.*** An *approved automatic sprinkler system* shall be installed throughout the entire building.

914.6.1

Amended exceptions. Amend as follows:

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. In buildings where an *automatic sprinkler system* is not otherwise required by other sections of this code, sprinklers are not required for *stages* 1,000 square feet (93 m2) 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.

2. Sprinklers are not required within portable orchestra enclosures on *stages.*

914.8.3

Removed exception. Amend as follows:

914.8.3 Fire suppression for aircraft hangars. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based upon the classification for the hangar given in Table 914.8.3.

918

New sections

SECTION 918
SMOKE REMOVAL

918.1 General. Where required by this code or otherwise installed, smoke removal systems shall conform to the requirements of this section and the Building Code.
918.2 Where Required.
918.2.1 High rise buildings. Smoke removal systems shall be installed in accordance with Section 403.4.7 of the International Building Code.
918.3 Status Indicators and Controls. Status indicators and controls shall be designed in accordance with the *fire code official's* guidelines.

918.4 Maintenance. Smoke removal systems shall be maintained in an operable condition at all times to ensure to a reasonable degree that the system is capable of removing smoke when required.

Inspection and periodic testing of smoke removal systems shall be performed in accordance with the Southern Nevada Fire Code Committee's Uniform Guideline for smoke control testing & recertification using a Level I inspection firm, and the manufacturer's instructions.

Table 1006.2.1

All other portions of the Table and all Footnotes remain unchanged. Amend as follows:

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCC.	MAX. OCC. LOAD OF SPACE	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)
		Occupant Load		
		≤ 30	>30	
R-1	20	NP	NP	125 [a]

1010.1.7

Added exception 4. Amend as follows:

1010.1.7 Door arrangement. Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

Exceptions:

1. The minimum distance between horizontal sliding power-operated doors in a series shall be 48 inches (1219 mm).
2. Storm and screen doors serving individual *dwelling units* in Groups R-2 and R-3 need not be spaced 48 inches (1219 mm) from the other door.
3. Doors within individual *dwelling units* in Groups R-2 and R-3 other than within *Type A* dwelling units.
4. The space between doors serving access vestibules of smokeproof enclosures shall be permitted to be in accordance with Section 909.20.1 of the International Building Code.

1030.6.2.3

Deleted exceptions 1 and 2. Amend as follows:

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.

Exception: Outdoor seating facilities where seating and the *means of egress* in the seating area are essentially open to the outside.

Chapter 11

Chapter 11 is deleted in its entirety. All references to Chapter 11 throughout this code are also deleted.

1207.1

Amend as follows:

1207.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in structures designed and constructed in accordance with the *International Residential Code* and Group R-3 and R-4 occupancies shall comply with Section 1207.11.

1207.11

Amend as follows:

1207.11 ESS in structures designed and constructed in accordance with the *International Residential Code*, Group R-3 and R-4 occupancies. ESS in structures designed and constructed in accordance with the *International Residential Code*, Group R-3 and R-4 occupancies shall be installed and maintained in accordance with Sections 1207.11.1 through 1207.11.9. The temporary use of an *owner* or occupant's electric-powered vehicle as an ESS shall be in accordance with Section 1207.11.10.

1207.11.7

Amend as follows:

1207.11.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers. Appliances in garages shall also be protected in accordance with Section 312.

3103.8.4

Amend as follows:

3103.8.4 Membrane structures on buildings. Membrane structures that are attached to or erected on buildings, balconies, decks or other structures shall be regulated as permanent membrane structures in accordance with Section 3102 of the *International Building Code.*

3104.2

Amend as follows:

3104.2 Flames propagation treatment. Before a permit is granted, the owner or agent shall file with the *fire code official* a certificate executed by and *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 or California Title 19 Office of the State Fire Marshal. 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 or California Title 19 Office of the State Fire Marshal as applicable. The flame performance criteria shall be effective for the period specified by the permit. Alternatively, the material 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 or California Title 19 Office of the State Fire Marshal. The flame propagation criteria shall be effective for the period specified by the permit.

Floor coverings are not evaluated per the same type of flame propagation tests required for fabrics, textiles, membrane materials and the like and should not be included in this code section that addresses flame propagation testing. Floor coverings are therefore proposed to be deleted without replacement in other sections and they are not a major factor in the evaluation of tents, canopies and membrane structures.

3201.3

Amend as follows:

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. Following approval of the plans, a copy of the approved plans shall be maintained on the premises in an approved location. The plans shall include the following:

1. Unchanged
2. Unchanged
3. Unchanged
4. Unchanged
5. Unchanged
6. Unchanged
7. Unchanged
8. Unchanged
9. Unchanged
10. Type of fire suppression systems.
    a. For density/area fire sprinklers protecting the high-piled storage area, indicate the sprinkler identification number (SIN), the sprinkler k factor, square footage of the remote area, and the system design density. If the SIN is not available, a copy of the manufacturer specification sheet for the sprinkler head is required.
    b. For specific application sprinklers, such as large-drop and ESFR sprinklers, protecting the high-piled storage area, indicate the sprinkler identification number (SIN), the sprinkler k factor, the number of sprinkler heads in the remote area, and the minimum residual pressure provided at the most hydraulically demanding sprinkler head. If the SIN is not available, a copy of the manufacturer specification sheet for the sprinkler head is required.
11. Unchanged
12. Unchanged
13. Unchanged
14. Unchanged
15. Type of shelving material used, whether it is solid, slatted, or wire mesh.
16. Verification of sufficient fire flow provided for the building, when required by the *fire code official*.
17. Indicate path of travel for all storage areas to the exits.

3311.3

New section

3311.3 Site identification sign. The street address of the construction site shall be posted on the street side of the site. Signage shall have approved address numbers, buildings numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Signage shall have nominal 12” high, 1” stroke numbering and lettering.

3313

New section

SECTION 3313

WATER SUPPLY FOR FIRE PROTECTION

3313.1 When required. Unchanged

3313.2 Combustible material protection. Where combustibles are delivered to a construction site, a minimum fire flow in accordance with Section 3313.5 shall be provided. The fire hydrant(s) shall be within 300 feet of combustible materials.

3313.3 Vertical construction, combustible construction Types III, IV, and V. Required fire flow shall be provided at the commencement of vertical construction in accordance with the separation distance as specified in this section.

3313.3.1 Separation up to 20 feet (6.1m). Where the structure is separated 20 feet (6.1m) or less from property lines against property that has an existing structure or otherwise can be constructed upon, a fire flow of no less than 100% of the required fire flow, including all required hydrant locations, shall be provided.

3313.3.2 Separation greater than 20 feet (6.1m) up to 60 feet (18.3m). Where the structure is separated greater than 20 feet (6.1m) and up to 60 feet (18.3m) from property lines against property that has an existing structure or otherwise can be constructed upon, a fire flow of no less than 50% of the required fire flow shall be provided. Sufficient hydrants to accommodate the required flow shall be provided, subject to approval by the *fire code official*.

3313.3.3 Separation greater than 60 feet (18.3m). Where the structure is separated greater than 60 feet (18.3m) from property lines against property that has an existing structure or otherwise can be constructed upon, fire flow shall be provided in accordance with Section 331352. The fire hydrant(s) shall be within 300 feet of the structure protected.

3313.4 Vertical construction, non-combustible construction Types I and II. Fire flow is not required prior to commencing vertical construction of non-combustible construction buildings. Where combustible materials are delivered to the construction site, fire flow in accordance with Section 3312.3 shall be provided. When a standpipe per Section 3313 is provided, fire flow shall be provided in accordance with Section 3312.2.

3313.5 Volume required. Unchanged

3313.6 Combustible loading (stocking). Where combustible loading (stocking) of the building has been approved by the *fire code official*, the fire flow provided shall be equal to 100% of the fire flow required at the time of building occupancy.

3313.7 Occupancy of Building. Prior to occupancy of the completed building, the required fire flow shall be provided, and flow tested to verify the water system's capability to supply the required fire flow. All acceptance testing shall be witnessed by the *fire code official*.

3313.8 Access. Access in accordance with Section 3311 shall be provided between all hydrants required by this section and the construction being protected.

3903.3

Added spray booth. Amend as follows:

3903.3 Location. The extraction equipment and extraction processes utilizing hydrocarbon solvents shall be located in a room or area dedicated to extraction. A listed spray booth conforming to the requirements of section 2404.3 may be used for this purpose.

3905.1.1

Added number 5. Amend as follows:

3905.1.1 Operation. Activation of the gas detection system shall result in all the following:

1. Unchanged.
2. Unchanged.
3. Unchanged.
4. Unchanged.
5. Mechanical ventilation rate shall be such that the air velocity over the cross-section of the extraction room in the direction of air flow is not less than 100 linear feet/minute.

Chapter 49

Added chapter 49, consisting of Sections 4901 through 4903, as follows:

SPECIAL PROVISIONS FOR BUILDINGS WITH AN OCCUPIED FLOOR GREATER THAN 55' ABOVE BUT NOT MORE THAN 75 FEET ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICULAR ACCESS

4901. Applicability. Buildings with an occupied floor located more than 55 feet above and not more than 75 feet above the lowest level of fire department vehicle access.

Exceptions: The provisions of Sections 4902 through 4903 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with *International Building Code* section 412.2.
2. Open parking garages in accordance with *International Building Code* section 406.5.
3. The portion of a building containing a Group A-5 occupancy in accordance with *International Building Code* section 303.6.
4. Special industrial occupancies in accordance with *International Building Code* section 503.1.1.

4902. Smoke detection. Smoke detection shall be provided in accordance with Section 907.2.13.

4903. Emergency voice/alarm communication system. An emergency voice/alarm communication system shall be installed in accordance with Section 907.5.2.2.

5003.2.2.1

Amend as follows:

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. Unchanged.
2. Unchanged.
3. Readily accessible manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:
   - 3.1 Unchanged.
   - 3.2 Unchanged.
4. Unchanged.
5. Unchanged.
6. New and existing remote tank filling connections shall be in accordance with this subsection 6.
   - 6.1 Permanent signs clearly indicating the tank contents associated with each connection port shall be displayed at the remote filling station. Signage 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*.
   - 6.2 The transfer hose connection for liquids that have a pH of 6.0 or less (acidic) shall be equipped with female "Cam-lock" type fittings or other mechanical connection means *approved* by the *fire code official*, sized appropriately.
   - 6.3 The transfer hose connection for liquids that have a pH of 8.0 or greater (basic) shall be equipped with male "Cam-lock" type fittings or other mechanical connection means *approved* by the *fire code official*, sized appropriately.

5003.11.1.1

New section

5003.11.1.1. Table 5003.11.1 shall not be applicable to mixed occupancies which include either an A, E, I, or R occupancy.

Exception: Single-story buildings.

5305.11

New section

5305.11 Temporary Indoor Carbon Dioxide Fog Effects. Maximum Allowable Quantity of Carbon Dioxide (CO2) shall be calculated as follows:

1) Calculate Stage Volume: Build an imaginary 'box' over stage that is 10' high and calculate the volume of the 'box'.
2) Calculate Allowable Cubic feet of CO2 within 'box': OSHA allowable short-term exposure limit for CO2 is 30,000 ppm or 3 %
3) Convert volume of CO2 to pounds by dividing by 8.74 lbs/ft3 CO2
4) If the desired amount of CO2 is less than the allowable calculated amount, then the desired quantity is acceptable
5) If more CO2 is desired, calculate air change rate of venue and determine number of air changes per show.
6) Calculate Venue Air Change Rate: Air change rate = venue volume / exhaust rate
7) Calculate number of Air Changes: Show length / air change rate
8) Calculate the Total Allowable CO2: Step 3 above, then multiply by the number of air changes

5306.6

New section

5306.6 Medical gas system plan submittal. Plans and specifications shall be submitted for review and approval. Following approval of the plans, a copy of the approved plans and permit shall be maintained on the premises in an approved location. As required by the *fire code official*, the plans shall include the following:

1. Project name, street address and owners name.
2. Contractor name, address, phone number, license numbers (City, State Contractor and State Fire Marshal).
3. Signature of the licensee (contractors Master or Qualified Employee) or seal and signature of a Professional Engineer licensed in the state of Nevada.
4. Code edition of standards used in the design.
5. System classification.
6. When used - gas type, container size and quantity.
7. Symbol legend with equipment description (manufacture's name and model number) and mounting description (surface, semi-flush, flush, and exterior).
8. Site plan.
9. Floor plan drawn to an indicated scale (1/8" minimum) on sheets of a uniform size showing:
    a. Point of compass (north arrow).
    b. Walls, doors, windows, openings, stairs, elevators, passageways, high-piled storage racks, etc., as applicable to depict the facility.
    c. Room use identification labels.
    d. Gas, air and vacuum piping distribution systems, manifolds, sizes and material types. Piping hangers and slopes.
    e. Valves and valve boxes, outlets, gages and other components.
    f. Electrical warning systems (local and master alarm panels), conductor/conduit routing and size, power panel and circuit connection.

g. Key plan.
h. Compressor inlet location and vacuum exhaust outlet location.
i. For interior gas supply rooms provide construction fire ratings, ventilation, and fire sprinkler information.

10. Product data submittal including a cover index sheet listing products used by make and model number, manufacturer data sheets (highlighted or marked) and listing information for all equipment, devices, and materials.
11. Design number and detail of penetration fire stop system when required.
12. Verification & inspection requirements.
13. Name of independent medical gas testing agency to certify the system.
14. Any additional information determined necessary.

5306.7

New section

5306.7 Medical gas systems, testing. Hyperbaric systems and medical gas systems required by NFPA 99 to be verified by person other than the installing contractor shall be certified by an independent medical gas testing agency prior to use of the system. The independent medical gas inspector shall hold a current NITC certification and Nevada State Fire Marshal certification as a medical gas inspector. The *fire code official* may witness any or all testing. Copies of the system certification shall be provided to the *fire code official*.

5307.3.2

Amend as follow:

5307.3.2 Gas detection system. Unchanged.

1. Unchanged.
2. Activates an audible and visible alarm within the room or immediate area where the system is installed and stops the flow of carbon dioxide into the piping system upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m^3).

5601.1.3

Amend as follows:

5601.1.3 Fireworks The possession, manufacture, storage, sale, handling, and use of fireworks are prohibited.
Exceptions:

1. Unchanged.
2. Unchanged..
3. Unchanged..
4. Unchanged..
5. The possession, storage, use, handling, and sale of consumer safe and sane fireworks in accordance with the current “Fire Prevention Association of Nevada Guidelines for Fireworks”.

5601.2.2

Amend as follows:

5601.2.2 Sale and retail display. All sales and retail displays of fireworks and explosives are prohibited.

Exception: Consumer fireworks 1.4G (safe and sane) offered for sale at portable retail fireworks stands that are in accordance with the current “Fire Prevention Association of Nevada Guidelines for Fireworks”.

5601.2.4

Amend as follows:

5601.2.4 Financial Responsibility. Before a permit is issued, as required by Section 5601.2, the applicant shall file with the jurisdiction a valid certificate of insurance complying with Section 105.1.7.1 in the amount of $5,000,000.00, for the purpose of the payment of all damages to persons or property that arise from, or are caused by, the conduct of any act authorized by the permit upon which any judicial judgment results. The *fire code official* is authorized to specify a greater amount when, in his or her opinion, conditions at the location of use indicate a greater amount is required.

5601.2.4.1

Amend as follows:

5601.2.4.1 Blasting. Before approval to do blasting is issued, the applicant for approval shall submit a certificate of insurance as specified in Chapter 1 in such form, amount and coverage as determined by the legal department of the jurisdiction to be adequate in each case to indemnify the jurisdiction against all damages arising from permitted blasting.

5601.2.4.2

Amend as follows:

5601.2.4.2 Fireworks Display. The permit holder shall furnish a certificate of insurance as specified in Chapter 1 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.

5601.5

Amend as follows:

5601.5 Supervision. The *fire code official* is authorized to require operations permitted under the provisions of Section 5601.2 to be supervised at any time by the *fire code official* in order to determine compliance with all safety and fire regulations. *Fire code official*(s) or approved designee(s) shall be required for all productions where pyrotechnic special effects are used.

> **Exception**: Where the pyrotechnic special effects are used in an approved set show that is repeated continuously without change, the *fire code official* may waive the requirement for attendance to all productions, provided the fire code official has successfully witnessed product demonstration and at least one performance.

5603.8

New section

5603.8 Shot reports. Shot reports shall be maintained for every blast. These reports shall be available to the *fire code official* upon request within 48 hours. The report shall at a minimum contain the following information:

1. Date and time of the blast.
2. Company name and contact information.
3. Location of the blast.
4. Weather conditions including temperature and wind speed.
5. Quantity and description of all materials used.
6. A list of any un-spent or misfired products.
7. A list of all personnel present.
8. The license type and card number of the blaster.
9. The signature of the blaster or shooter in charge.

10. For blasting operations, the report shall include the seismic data.

5604.1

Amend as follows:

5604.1 General. Storage of *explosives* and *explosive materials*, small arms ammunition, small arms primers, propellant-actuated cartridges, and smokeless propellants in magazines shall comply with the provisions of this section. *Explosive materials* shall be stored only in areas with appropriate zoning and use permits as required by the planning or zoning authority and shall be subject to the approval of the *fire code official*.

5604.6.5.2

Amend as follows:

5604.6.5.2 Placards. Type 5 magazines containing Division 1.5 blasting agents shall be prominently placarded during storage as required during transportation by DOTn 49CFR, Part 172 and DOTy 27 CFR, Part 555. All other magazines shall be labeled with the hazard classification only.

5604.7.1

Amend as follows:

5604.7.1 Security. Magazines shall be kept locked in the manner prescribed in NFPA 495 at all times except during placement or removal of *explosives*, inventory, or inspection. In addition to the locking requirements, the following security measures shall be required at all explosive storage locations.

1. The entire magazine site shall be fenced. The fence shall be a minimum of 8 feet in height and constructed of non-combustible materials.

   Exception: Indoor storage locations shall be secured in a manner consistent with NFPA 495.

2. All explosives magazines and storage sites shall submit a security and site access control plan to the *fire code official*.

5604.7.1.1 Security and site access control plan. Security and site access control plans shall include at a minimum:

1. Site management. The plan shall include details of how access to the site is restricted, tracked, and monitored.
2. Security. The plan shall include details on the method of site security. Security alarm system, video or motion activated cameras, manned security guards, or other approved method.
3. Record keeping. The plan shall include the procedures for how the inventory of explosives materials and blasting agents are tracked and maintained.
4. Emergency contact. A primary and secondary emergency contact person and phone number shall be provided.

5605.1

Amend as follows:

5605.1 General. The manufacture, assembly and testing of *explosives*, ammunition, blasting agents and fireworks is prohibited.

Exceptions:

1. Unchanged.
2. Unchanged.
3. Unchanged.
4. Subject to approval of the *fire code official* and obtaining proper approvals from the planning and zoning authority.

5607.3.1

New sections

5607.3.1 Blasting activities. The blasting contractor shall comply with the following requirements in connection with all blasting activities:

1. All blasts shall be monitored at the nearest structure by a third-party engineering firm. Utilities or other critical infrastructure within 300 feet of the blast area shall be monitored by a third-party engineering firm. Such monitoring shall be done by a seismologist using a certified, annually calibrated, seismic monitor that shall be capable of measuring blast-induced vibration and blast-induced sound levels.
2. A minimum of two seismographs shall be used to obtain data from each blast or as required by the *fire code official*.
3. The maximum ground-borne vibrations shall not exceed a single component peak particle velocity (vector sum) of 0.5 inches per second at the nearest structure.
4. For utilities and other critical infrastructure within 300 feet of the blast-area, the maximum ground-borne vibrations shall not exceed the limits as set forth by the specific utility purveyors or critical infrastructures engineering department. A written approval from the utility purveyor or critical infrastructure detailing these limits shall be provided to the *fire code official* prior to any blasting activities.

   Exception: If the utility or critical infrastructure purveyor does not provide written approval within a reasonable period of time, as determined by the *fire code official,* the applicant may request permission to submit a blast plan designed so that the maximum ground-borne vibrations shall not exceed a single component peak particle velocity (vector sum) of 0.5 inches per second at the nearest utility or other critical infrastructure.
5. The maximum air blast shall not exceed 120 dB at the nearest structure.
6. Monitoring results shall be reported to the *fire code official* within 48 hours via e-mail.
7. The blasting contractor shall provide a minimum of 72 hours prior written notice of blasting activities and project duration to all residences, property owners, businesses, and public uses within 2500 feet of the blasting area. The manner, form, and content of any such notice shall be subject to the approval of the *fire code official*.
8. For utility notification, see 5607.5
9. The blasting contractor shall notify the *fire code official* and fire department dispatch by telephone a minimum of two (2) hours prior to each blast, and immediately following each blast.
10. The blasting contractor shall provide for pre-blast and post-blast surveys of all structures, utilities, and other critical infrastructures within 300 feet of the blast area, or when otherwise required by condition of the *fire code official*. These surveys must be completed by a third-party engineering firm at no cost to the owner.
11. A traffic and access control plan shall be provided when blasting activities are conducted within 100 feet of any public roadway, or when required by the *fire code official*. The plan shall include warning signage, flagging, temporary road closure, and detour routes. This plan may be subject to the approval of the local law enforcement agency.
12. The blasting contractor shall be responsible for removing and cleaning up any debris from the blast site and adjacent properties.

Exception: These requirements may be modified by the *fire code official*.

5607.3.2 Permit Requirements. A permit is required for the storage and or use of explosives, and for any proposed excavation or development activity that will involve blasting. The permit must be obtained by the blasting contractor prior to the beginning of any drilling or blasting activities. The application shall be made to the fire department in such a form and detail as described by the *fire code official*. Applications for permits shall be accompanied by plans detailing the proposed blasting activities as required by the *fire code official*.

5607.4

Amend as follows:

5607.4 Restricted hours. Blasting operations shall be limited to the hours of 8 a.m. to 4 p.m., Monday through Friday, excluding state-recognized holidays unless otherwise approved by the *fire code official*.

5607.5

Amend as follows:

5607.5 Utility Notification. The blasting contractor shall contact "Call Before You Dig" to obtain a utility notification dig-ticket number a minimum of 48 hours prior to commencing any drilling or blasting activities. A copy of the dig ticket shall be provided to the *fire code official* upon request.

Exception: In an emergency, the time limit shall not apply when *approved*.

5607.13

Amend as follows:

5607.13 Pre-blast procedures. A blast shall not be fired until:

1. The blaster has made certain that all surplus explosives materials are in a safe place in accordance with Section 5607.10 and;
2. All construction workers and equipment are at a safe distance and;
3. Seismic monitor(s) are set up and;
4. All access to the blast site has been shut down and secured and;
5. Communication has been set up between the blaster in charge and those persons securing the blast site and;
6. That adequate warning signals have been given.

5607.13.1

New section

5607.13.1 Warning Signals. Warning signals shall be given to alert construction workers on or near a blast site that a blast is going to occur.

1. A warning signal shall be given five minutes prior to the blast and;
2. A warning signal shall be given one minute prior to the blast and;
3. A warning signal shall be given following the blast in accordance with 5607.14 (4).

5607.14

Amend as follows:

5607.14 Post-blast procedures. After the blast, the following procedures shall be observed.

1. Unchanged.
2. Unchanged.

3. Unchanged.
4. The blaster shall sound an all-clear warning signal in accordance with 5607.13.1

5608.1

Amend as follows:

5608.1 General. Outdoor fireworks displays, use of pyrotechnics before a *proximate audience* displays and pyrotechnic special effects in motion picture, television, theatrical, and group entertainment productions, shall comply with the *fire code official's* guidelines, Sections 5608.2 through 5608.10, and NFPA 1123, NFPA 1126, or NFPA 160.

5704.2.9.2.5

New section.

5704.2.9.2.5 Fire flow. Fire flow shall be based on flash point of the most hazardous liquid stored and the estimated foam requirement for the largest tank, in accordance with Table 5704.2.9.2.5(a) and Table 5704.2.9.2.5(b). The minimum fire flow provided shall be equal to the sum of flows required by these tables. Minimum fire flow duration shall be 4 hours.

Table 5704.2.9.2.5(a)
Hose Stream Demand for Tanks Storing Flammable and Combustible Liquids [1]

Flash Point of Liquid	Largest Tank	Largest Exposed Tank
<140° F	1000 gpm [2]	500 gpm [2]
≥140° F	750 gpm	250 gpm

[1] Required flow may be reduced by half for horizontal tanks.
[2] Add 250 gpm for each 100 ft. increase in tank diameter above 100 ft.

Table 5704.2.9.2.5(b)
Estimated Water Demand for Fixed Foam Protection for a full Surface Fire

Tank Diameter (ft)	Water Demand (gpm)
50	200
100	800
150	2000
200	3200
250	5000
300	7100

5704.2.13.1.3

Removed abandoned in place. Added last sentence with local compliance information. Amend as follows:

5704.2.13.1.3 Out of service for one year. Underground tanks that have been out of service for a period of one year shall be removed from the ground in accordance with Section 5704.2.14. Coordination and compliance with Environmental Health Division of Southern Nevada Health District for tank removal is the responsibility of the owner and contractor.

5704.2.13.1.4

Delete Section 5704.2.13.1.4 Tanks abandoned in place.

5704.5

New sections

5704.5 Generator and Fire Pump Diesel Fuel Tanks.

5704.5.1 Exterior Installations. Exterior installations shall be in accordance with this section.

5704.5.1.1 Secondary containment. Tanks shall be listed and labeled as a secondary containment tank in accordance with UL 142 or shall be a UL 2085 tank.

5704.5.1.2 Separation distances. Aboveground tanks shall be separated from property lines, important buildings, public ways, and other tanks in accordance with NFPA 30.

5704.5.2 Interior Installations. Interior installations of aboveground fuel tanks shall comply with Chapters 6, 50 and 57.

5706.2.4.4

Amend as follows:

5706.2.4.4 Locations where above-ground tanks are prohibited. The storage of class I, II, and III liquids in above-ground tanks outside of buildings is prohibited.

Exception: When approved by the planning or zoning authority (in jurisdictions requiring this specific approval) and when *approved* by the *fire code official*.

5706.5.1.6

Added the last sentence. Amend as follows:

5706.5.1.6 Fire Protection. Fire Protection shall be in accordance with Section 5703.2. Where operations involve vehicle loading of Class I and/or Class II liquids, the loading areas shall be protected with approved automatic fire protection systems.

5706.5.4.5

Amend as follows:

***5706.5.4.5 Commercial, industrial, governmental, or manufacturing.** Dispensing of motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental, or manufacturing establishments is allowed where permitted, provided such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only out of mobile fueling vehicles that have been issued a permit to conduct mobile fueling by the jurisdiction where the business license address is located.

*2 – 25 remain unchanged.

5806.2

Amend as follows:

5806.2 Limitations. Storage of flammable *cryogenic fluids* in stationary containers outside of buildings is prohibited.

Exception: When *approved* by the planning or zoning authority (in jurisdictions requiring this specific approval) and when *approved* by the *fire code official*.

6101.3

Amend as follows:

6101.3 Construction documents. Where a permitted LP-gas container is installed, the installer shall submit construction documents for such installation.

6104.2

Amend as follows:
6104.2 Liquefied petroleum gas storage containers. Maximum capacity within established limits. 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).

Exception: When *approved* by the planning or zoning authority (in jurisdictions requiring this specific approval) and/or when *approved* by the *fire code official*.

80

Amend as follows:

Chapter 80 REFERENCED STANDARDS, NFPA,

54-18	National Fuel Gas Code
70-11	National Electrical Code
140-18	Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Location
409-22	Standard on Aircraft Hangers

Appendix B

Table B105.1(1)

Amend as follows:

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO- FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE FLOW CALCULATION AREA (square feet)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	1,000	1
3,601 and greater	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate

For SI: 1 square foot = 0.0929 m2, 1 gallon per minute = 3.785 L/m.

Table B105.2

Amend as follows:

Table B105.2

REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No *automatic sprinkler system*	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the International Fire Code	Aircraft Maintenance Hanger: 100% *High-piled Combustible Storage/High-rise Buildings*: 75% All Other Buildings: 50% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the International Fire Code	High-rise Buildings: 75% All Other Buildings: 50% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m

a. The reduced fire flow shall be not less than 1,500 gallons per minute

Appendix C

Delete Existing Appendix C Text and Replace with the Following:

Section C101
General

C101.1 Scope. Fire hydrants shall be provided in accordance with this appendix for the protection of buildings, or portions of buildings, as required by Section 507. Design shall comply with the Clark County Uniform Design and Construction Standards (UDACS) for public installations or NFPA 24 for private installations, as applicable.

Section C102
Location

C102.1 Fire hydrant locations. Fire hydrants shall be provided along required fire apparatus access roads
C102.2 Intersections. The spacing of fire hydrants shall start by placing fire hydrants at all intersections.
C102.3 R-3 Occupancies and single-family dwellings built under the IRC. In all residential areas (R-3 occupancies and single-family dwellings built under the IRC only), hydrants shall be spaced not to exceed 500 feet, or 600 feet if all homes are protected by approved automatic fire sprinkler systems.
C102.4 Distance from Hydrant to R-3 Occupancy and single-family dwelling built under the IRC. The maximum distance from a one- or two-family dwelling to a fire hydrant shall not exceed 300 feet, as measured from an approved point on a street or road frontage to a fire hydrant. An approved point is defined as the property line furthest from the hydrant, at a right angle to the street.
C102.5 Commercial and Residential Occupancies other than R-3 and single-family dwelling built under the IRC. In all commercial and industrial areas, including multi-family R-1 and R-2 occupancies, hydrants shall be spaced not to exceed 300 feet, or 400 feet if all buildings are protected by approved *automatic sprinkler systems*.
C102.6 Distance to Dead-End Street. The maximum distance from a hydrant to the end of a dead-end street shall not exceed 200 feet.
C102.7 Distance to a Fire Department Connection (FDC). The maximum distance from a fire hydrant to a fire department connection (FDC) supplying fire sprinklers and/or standpipes shall not exceed 100 feet, as measured

by an approved route. An approved route is defined as an unobstructed path of travel on which hose can easily be laid.

Exception: The distance shall be permitted to exceed 100 feet (30480mm) where approved by the fire code official.

C102.8 Spacing Along Major Streets. Where streets are provided with median dividers or have four or more travel lanes and a traffic count of more than 30,000 vehicles per day, hydrants shall be spaced at a maximum of 1,000 feet along both sides of the street; arranged on an alternating basis at 500–foot intervals.

C102.9 Hydrants Provided with New Water Mains. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide water for transportation hazards

C102.10 Hydrant Clearances from Structures. No fire hydrant shall be located within 6 feet of a driveway, power pole, light standard, or any other obstruction. For wall, fence and planter locations, a perimeter around the hydrant measuring a minimum of 3 feet from its exterior shall be maintained clear of all obstructions at all times.

C102.11 Hydrant set-back from curbs. Fire hydrants shall be located 4 feet to 7 feet from the back of curb. Where it is not possible to locate the hydrant a minimum of 4 feet from the back of the curb, the hydrant shall be protected against vehicular impact in accordance with Section 312.

C102.12 Hydrant Pad. A concrete pad, with minimum dimensions of 3 feet by 3 feet, with a minimum depth of 10 inches, shall be provided at each fire hydrant.

Section C103
Approved Fire Hydrants

C103.1 Scope. Hydrants that are proposed for installation in public water systems shall be in accordance with approved fire hydrants as allowed by the water purveyor. Hydrants proposed for installation on private water systems shall be in accordance with approved fire hydrants as allowed by the Fire Department.

Section C104
Supply and Underground Mains

C104.1 Supply points. Two sources of water supply are required whenever 4 or more fire hydrants and/or sprinkler (per Section 903.3.1.1 and/or 903.3.1.2) lead-ins are installed on a single system. Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated.

C104.2 Sectional Control Valve. For systems required to have two sources of water supply per C104.1, sectional control valves shall be installed so that no more than 2 fire hydrants and/or fire sprinkler (per Section 903.1.1 and/or 903.3.1.2 only) lead-ins can be out of service due to a service interruption.

C104.3 Minimum Size of Line. Supply lines feeding multiple fire hydrants shall have a minimum diameter of 8 inches, with a dead-end maximum length of 150 feet of 6-inch underground pipe supplying only one hydrant.

C104.4 Pressure Rating. Underground piping shall have a minimum working pressure of 150 psi (Class 235). Underground piping connected to a fire pump or a Fire Department Connection (FDC) shall have a minimum working pressure of 200 psi (Class 305).

C104.5 Restraint. All underground water lines shall be restrained in accordance with applicable codes and standards.

C104.6 Listings. All on-site underground water mains and materials shall be U.L. listed, A.W.W.A. compliant , and shall be rated for the appropriate working pressure.

Section C105
Satisfying Fire Flow Requirements
(in Accordance with Appendix B)

C105.1 Minimum number of hydrants. The minimum number of fire hydrants required to meet the fire flow shall be based on a maximum flow of 1,000 gallons per minute per hydrant. All hydrants utilized in providing the fire flow shall be within 750 feet of the structure being protected as measured along the street or approved fire apparatus access road.

Exception: In unincorporated Clark County and the City of Las Vegas the maximum flow per hydrant shall be 1,500 gallons per minute.

C105.2 Hydrants on adjacent properties. Fire hydrants on adjacent properties shall not be considered unless fire apparatus access roads extend between properties and recorded easements are established.

Section C106
Construction Operations

C106.1 Construction Hydrants. Hydrants shall be provided for construction in accordance with Section 33133313.
C106.2 Placing hydrant out of service. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Department prior to placing the hydrant out of service.

Section C107
Hydrant Markings

C107.1 Hydrant Markings. Hydrants shall be painted safety yellow for public and safety red for private, shall have their location marked in the adjacent fire access lane by a blue reflective pavement marker and shall have red painted curbs 15 feet in each direction. Hydrant markings shall be in accordance with Section 507.
C107.2 Hydrant Marking Maintenance. Hydrant marking shall be maintained in accordance with Section 507.

Appendix O

New appendix

Appendix O
Proprietary Supervising Station Facilities

Section O101
General

O101.1 Scope. Proprietary supervising station facilities (self-monitoring facilities) shall meet all of the requirements of this appendix.
O101.2 Permit Required. The proprietary supervising station facility shall maintain an annual operational permit.

Section O102
Site Requirements

O102.1 Location. The proprietary supervising station shall be located in a property's Fire Command Center, or other approved location.
O102.1.1 Equipment. The approved location shall have at a minimum the following items:

1. A fire alarm annunciator that has appropriate control capabilities.
2. An all-call microphone and all-call evacuation switch.
3. Switches that activate the evacuation message, the investigation message (if applicable), and the all-clear message for the active alarm zones.
4. A printer that is provided with a secondary power source such as an uninterruptible power supply or other approved means.
5. Copy of the approved SOP as required by Section O104.

O102.2 Retransmission Means. Two means of retransmission shall be provided. The primary means of retransmission shall be a land-line telephone. The secondary means of retransmission shall be a dedicated cellular telephone.

Section O103
Personnel

O103.1 Qualifications. Proprietary supervising stations shall be operated by trained personnel in constant attendance who are responsible to the owner of the protected property.
O103.1.1 Evidence of training. Annually the applicant shall certify in writing to the *fire code official* that all authorized personnel have received training in the recognition and proper handling of alarm signals. Evidence of annual training for each authorized personnel shall be provided when requested by the *fire code official*.

0103.2 Training. Operators shall be trained on a yearly basis either by the installing fire alarm contractor, by the fire alarm maintenance contractor, or by the manufacturer's representative of installed fire alarm system. Documentation of annual training shall be kept on site and available upon request of the *fire code official*. Operators shall be trained on the following:

1. How to differentiate between a water flow alarm signal, a fire alarm signal, a fire supervisory signal, and a fire trouble signal.
2. The basic operations of the panel, including but not limited, to the following: signal acknowledgment, resetting of the fire alarm system, selection of evacuation zones, and activating of the evacuation, investigation (if applicable), and all-clear evacuation messaging.
3. The Standard Operating Procedures (SOP's) required by Section 0104 for the facility.

0103.3 Number of personnel. At least two operators shall be on duty at all times. One of the two operators shall be permitted to be a runner.

0103.4 Coverage. Adequate staffing shall be provided for runners to survey the entire facility within three minutes when responding to either a water flow alarm signal or a fire alarm signal.

Section 0104
Standard Operating Procedures

0104.1 General. A Standard Operating Procedure (SOP) shall be submitted to the *fire code official* when applying for the required annual permit for proprietary supervising station facilities. The SOP shall outline procedures with regards to emergency procedures and the disposition of the alarm, supervisory, and trouble signals. The SOP shall include at a minimum the following items:

1. The number of operators that will be on duty at all times.
2. The location and the equipment found within the proprietary supervising station facility.
3. The facilities' procedures in handling alarm, supervisory, and trouble signals.

Section 0105
Disposition of Signals

0105.1 Alarm signals. Upon receipt of a fire alarm signal, the proprietary supervising station operator shall immediately dispatch a runner to the alarm location identified on the fire alarm control unit.

a. If the fire is verified, immediately activate the evacuation message on the fire alarm system and initiate notification procedures. See 0103.4 for coverage requirements.
b. If the alarm is false, the fire alarm system shall be reset. If either an investigation message or an evacuation message has been activated, then sound an all-clear message.

0105.2 Supervisory signals. Upon receipt of a supervisory signal, the proprietary supervising station operator shall Immediately dispatch runner to the location identified on the fire alarm control unit, unless the supervisory conditions are promptly restored.

0105.3 Trouble signals. Upon receipt of trouble signals or other signals pertaining solely to matters of equipment maintenance of the fire alarm system, the proprietary supervising station operator shall immediately dispatch runner to the location identified on the fire alarm control unit, unless the trouble conditions are promptly restored.

Section 0106
Record-Keeping

0106.1 Alarms. A written log of all fire alarm signals shall be maintained in the Fire Command Center including:

1. The investigating person's name.
2. The device address.

3. The type of alarm.
4. The date and time of receipt of the fire alarm signals.
5. The cause and disposition of the fire alarm signals.

Appendix P

New appendix

Appendix P
FIRE PROTECTION SYSTEMS – IMPAIRMENTS AND SYSTEMS OUT OF SERVICE

Section P101
IMPAIRMENT PROCEDURES

P101.1 General. In addition to the requirements of Section 901.7 alternative protection measures shall be provided in accordance with this Appendix. Tables P102.1 (a) and P102.1 (b) shall be used by the impairment coordinator to determine the alternative protection measurers required.

P101.2 Impairment Coordinator Procedures. For all impairments, both planned and emergency (unplanned), an impairment coordinator shall be designated per Section 901.7.1. An impairment coordinator is the person responsible for maintenance of a particular fire protection system. When an *impairment coordinator* is not designated the *owner* shall be considered the impairment coordinator.

The impairment coordinator is responsible for informing the Fire Department as to the nature of the impairment and its status, coordinating necessary repairs, tagging systems per Section 901.7.2 & 901.7.3, and implementing required alternative protection measures.

For all planned impairments, the impairment coordinator shall engage licensed contractors to conduct work needed on the fire protection systems. For all emergency impairments, the impairment coordinator shall contact the appropriate fire sprinkler, fire alarm or other fire protection system maintenance contractor to initiate emergency service response.

P101.3 Maintenance Contractor Procedures. The maintenance contractor shall assess the impairment and provide a time estimate for the repair (impairment duration). The impairment coordinator shall use this time estimate and Tables P102.1(a) and P102.1(b) to determine the appropriate actions to take. Where the impairment is discovered during maintenance activities, the maintenance contractor shall contact ownership to request an impairment coordinator. The maintenance contractor shall estimate the time required for repair and report the impairment in accordance with this section.

P101.4 Impairment Procedure Tables. The impairment coordinator shall comply with impairment tables P102.1 (a) and P102.1 (b). Alternative protection measures are categorized as:

1. Notifying fire dispatch
2. Instituting a fire watch within the building area where fire protection is impaired
3. Providing other alternative protection measures as determined by the *Fire Code Official* on a case-by-case basis.

P101.4.1 Notify Dispatch. When required by Tables P102.1 (a) and P102.1 (b) the impairment coordinator shall notify the Fire Department dispatch center and *fire code official*.

P101.4.2 Fire watch. When required by Tables P102.1 (a) and P102.1 (b) the impairment coordinator shall institute a fire watch within the building area where fire protection is impaired for the duration of the impairment. Fire watch shall be in accordance with the Fire Watch Guideline. Fire watch personnel shall be provided at a rate of 1 person per 100,000 square feet of building area, over the entire area of the building affected by the impairment. Fire watch personnel shall meet the following characteristics:

1) Be capable of walking the building continuously during the shift. The fire watch shall walk over all assigned floor areas, including all exits from the floor areas assigned. Where the fire watch needs to take a break, another fire watch person shall cover the area during the break.
2) Be equipped with a bullhorn, flashlight, and cellular phone
3) Be capable of assisting employees and building occupants to evacuate the building in an emergency situation while utilizing the flashlight to illuminate the means of egress. This activity may be required within the assigned fire watch area, or in assistance to other fire watch personnel in other fire watch areas in the building.
4) Be capable of calling emergency services by dialing 911 in case of fire. Upon discovery of fire, fire watch personnel shall first call 911, and then advise all other fire watch personnel of the emergency in order to obtain their assistance in notifying and evacuating employees and building occupants.

P101.4.3 Other Measures. When determined necessary by the *Fire Code Official*, on a case-by-case basis, the impairment coordinator may be required to implement additional protection measures. The measure(s) available to the *Fire Code Official* include, but are not limited to, the following:

1) Fire Department oversight of Fire Watch.
2) Manning of equipment, such as manual release buttons for deluge systems.
3) Discontinuance of hazardous activities, such as cooking, welding, and pyrotechnic displays.
4) Removing hazard from building, i.e., as removing an airplane from a hangar.
5) Have all fire doors and shutters closed.
6) Manually activate smoke control.
7) Shut down an elevator.
8) Unlock stair door locks.
9) Engine stand-by for supply to fire sprinkler/standpipe system.
10) Partial evacuation of building.
11) Full evacuation of building.

Any costs associated with providing alternative protection measures shall be borne by the building owner.

P102
Impairment Tables – Use Groups A, E, H, I and R

P102.1 Use Groups A, E, H, I and R. Groups A, E, H, I and R occupancies are deemed a high risk due to the characteristics of these occupancies. As such, alternative protection measures are tailored on a case-by-case basis in order to manage the risk in these occupancies. The impairment coordinator shall use the following tables P102.1 (a) and P102.1 (b) to address impairments to fire protection systems. When alternative protection measures are required by tables P102.1 (a) and P102.1 (b) the *Fire Code Official* shall be contacted.

TABLE P102.1(a)
SUPPRESSION-BASED SYSTEMS – USE GROUPS A, E, H, I, R

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
Fire Pump (standalone)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground fire service main out of service – redundant main and tank	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 6 hours	N	N
		> 6 hours	N	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (system still operational)	1	≤ 6 hours	N	N
		> 6 hours	Y	N
	2-5	≤ 4 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 4 hours	Y	N
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	N
Sprinkler System Repair/Sprinkler System out of Service	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler system inside the space)	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	Y	N
Clean-agent (without sprinkler system inside the space)	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
acts as secondary supply only		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

TABLE P102.1(b)
FIRE-ALARM SYSTEMS – USE GROUPS A, E, H, I, R

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
Main FACU Not Operational (No Stand-alone Nodes)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Main FACU Not Operational	1	≤ 5 hours	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
(Stand-alone Nodes are available)		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Node FACU panel is down	1	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single notification circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 10 hours	Y	N
Single Notification Device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler and fire alarm systems still operational)	1	≤ 12 hours	N	N
		> 12 hours	Y	Y
	2-5	≤ 12 hours	N	N
		> 12 hours	Y	Y
	6 or more	≤ 12 hours	N	N
		> 12 hours	Y	Y
Ground Fault	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	N	N
		> 5 hours	Y	N
Single Notification Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single Detection Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Automatic Doors not Releasing Automatically	1	≤ 2 hours	N	N
		> 2 hours	N	Y
	2-5	≤ 2 hours	N	N
		> 2 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Smoke Control Panel	1	≤ 4 hours	N	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
(automatic mode works)		> 4 hours	N	Y
	2-5	≤ 3 hours	N	N
		> 3 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Smoke Control Panel (automatic mode does not works)	NA	NA	N	Y
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

[1] If the building is protected with a fire sprinkler system, the "Estimated Repair Time" hours shown in this column may be doubled.

P103
Impairment Tables – Use Groups B, F, M, S

P103.1 Use Groups B, F, M, S. Groups B, F, M and S Occupancies are considered lower hazard occupancies. As such, the impairment guideline is tailored to manage the risks associated with those occupancies. Mitigation shall be in accordance with Table P103.1(a) and Table P103.1(b).

TABLE P103.1(a)
SUPPRESSION-BASED SYSTEMS – USE GROUPS B, F, M, S

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
Fire Pump	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 10 hours	N	N
		> 10 hours	N	Y
Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Underground fire service main out of service – redundant main and tank	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional	1	≤ 10 hours	N	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
(system still operational)		> 10 hours	Y	N
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	N
	6 or more	≤ 3 hours	N	N
		> 3 hours	Y	N
Sprinkler System Repair/Sprinkler System out of Service	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler system inside the space)	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N
		> 8 hours	Y	N
Clean-agent (without sprinkler system inside the space)	1	≤ 8 hours	Y	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

TABLE P103.1(b)
FIRE ALARM SYSTEMS – USE GROUPS B, F, M, S

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
Main FACU Not Operational (No Stand-alone Nodes)	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Main FACU Not Operational (Stand-alone Nodes are available)	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Node FACU panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 4 hours	Y	N
		> 4 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Single alarm circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler and fire alarm systems still operational)	1	≤ 24 hours	N	N
		> 24 hours	Y	Y
	2-5	≤ 24 hours	N	N
		> 24 hours	Y	Y
	6 or more	≤ 24 hours	N	N
		> 24 hours	Y	Y
Ground Fault	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single Detection Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Automatic Doors not Releasing Automatically	1	≤ 2 hours	N	N
		> 2 hours	N	Y
	2-5	≤ 2 hours	N	N
		> 2 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	Y
Smoke Control Panel (automatic mode works)	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Smoke Control Panel (automatic mode does not works)	NA	NA	N	Y
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

[1] If the building is protected with a fire sprinkler system, the "Estimated Repair Time" hours shown in this column may be doubled.

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4.3.4

Added occupancy information. Amend as follows:

4.3.4* Ordinary Hazard (Group 2). The following shall be protected with OH2 occupancy criteria in this standard:

(1) Spaces with moderate to high quantity and combustibility of contents.

(2) Stockpiles of contents with moderate to high combustibility that do not exceed 12 ft (3.7 m), and stockpiles of contents with high rates of heat release do not exceed 8 ft (2.4m).

Occupancies containing Casinos, Mini-Storage Facilities, and Shell Buildings, regardless of occupancy classification (unknown tenants and/or floor layout), shall be signed to meet the requirements of Ordinary Hazard Group 2.

4.5.4.1

Added when acceptable to the authority having jurisdiction and buildings assigned the same street address without independent building numbers. Amend as follows:

***N*4.5.4.1** When acceptable to the authority having jurisdiction, multiple buildings that are assigned the same street address, without independent building numbers, and are attached by canopies, covered breezeways, common roofs, or a common wall(s) shall be permitted to be supplied by a single fire sprinkler riser.

4.10.2

Deleted section 4.10.2. Amend as follows:

4.10.2* Limited-Combustible (Material). Deleted in its entirety throughout this standard. This term shall have no ordinary accepted meaning as noted in Section 4.10 as it relates to the installation of limited-combustible material for the installation of sprinkler systems. This deletion shall apply throughout this standard and throughout all referenced codes and standards.

5.1.5.2

Added minimum Corrosion Resistance Rating. Amend as follows:

5.1.5.2 Water supplies and environmental conditions shall be evaluated for conditions that contribute to unusual corrosive properties. Where conditions are found that contribute to unusual corrosive properties, the owner(s) shall notify the sprinkler system installer and a plan shall be developed to treat the system using one of the following methods:

(1) Install a water pipe that shall have a minimum Corrosion Resistance Rating (CRR) of 1.
(2) Treat water that enters the system using a listed corrosion inhibitor.

(3) Implement an approved plan for monitoring the interior conditions of the pipe at established intervals and locations.
(4) Install corrosion monitoring station and monitor at established intervals.
(5) Fill dry-pipe or preaction systems with nitrogen as a supervisory gas to mitigate against corrosion.
(6) When using a generator, use an approved nitrogen generator.

6.1.2

Amend as follows:

6.1.2 System components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 175 psi (12 bar) for components installed above ground and 150 psi (10 bar) for components installed underground. When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (for example, Class 305PVC), or 50 psi greater than the system design pressure whichever is greater.

6.2.2

Added last sentence. Amend as follows:

6.2.2 All fittings used in private fire service mains shall be rated for the maximum system working pressure to which the fittings are exposed, but shall not be rated at less than 150 psi (10 bar). When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi, or 50 psi greater than the FDC design pressure, whichever is greater.

7.1.2

Added last sentence. Amend as follows:

7.1.2 Rated Pressure. System components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 175 psi (12 bar) for components installed above ground and 150 psi (10 bar) for components installed underground. When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (for example, Class 305 PVC), or 50 psi greater than the system design pressure whichever is greater

8.1.3

Added antifreeze and deleted deluge system. Added percentage of system size. Amend as follows:

8.1.3 Auxiliary Systems. A wet pipe system shall be permitted to supply an auxiliary antifreeze, dry pipe, or preaction system provided the auxiliary system covers less than 10% of the system size.

8.2.3.1

Deleted sections 8.2.3.3, 8.2.3.4. Amend as follows:

8.2.3.1 The system capacity (volume) controlled by a dry pipe valve shall be determined by 8.2.3.2 or 8.2.3.5.

8.2.3.3

Delete Section **8.2.3.3.**

8.2.3.4

Delete Section **8.2.3.4.**

8.2.3.5

Added last sentence. Amend as follows:

8.2.3.5 System size shall be based on dry pipe systems being calculated for water delivery in accordance with 8.2.3.6. Testing of the system shall be accomplished by the methods indicated in 8.2.3.7.

8.2.6.3

Added 8.2.6.3.1.1 – 8.2.6.3.1.2 Amend as follows:

8.2.6.3 Air Supply.

8.2.6.3.1 The compressed air supply shall be from a source available at all times.

8.2.6.3.1.1 The compressed air device shall be hardwired or connected to the power source in an approved manner.

8.2.6.3.1.2 The compressed air supply device shall be secured in place in an approved manner.

8.2.6.6.5.2

New Section

8.2.6.6.5.2 Automatic Air Maintenance. A high/low pressure supervisory signal to a constantly attended location shall be installed.

8.3.2.3.1.3

Added last sentence. Amend as follows:

8.3.2.3.1.3 The system size for double interlock preaction systems shall be based on calculating water delivery in accordance with 8.2.3.6, anticipating that the detection system activation and sprinkler operation will be simultaneous. A system meeting the requirements of this section shall be required to also meet the requirements of 8.2.3.7.

8.6.2.3

New section.

8.6.2.3 Antifreeze Solutions. The listed antifreeze solution shall be prepared with a freezing point at or below 2° F (-16.7° C) .

8.9.3.1

Added additional sprinkler requirements at 20-foot intervals on vertical risers. Amend as follows:

8.9.3.1 Unless the requirements of 8.9.3.2 or 8.9.3.4 are met, exhaust ducts shall have one sprinkler or automatic spray nozzle located at the top of each vertical riser, and at the midpoint of each offset, and an additional sprinkler shall be installed within the duct at 20-foot intervals on vertical risers where not otherwise provided with sprinklers due to offsets in buildings over two stories

8.9.9

Added dedicated supply riser, flow switch and check valve. Amend as follows:

8.9.9 Indicating Valves. A dedicated supply riser, including flow switch, check valve, and a listed indicating valve shall be installed in the water supply line to the sprinklers and spray nozzles protecting the cooking and ventilating system.

9.2.1.11

Delete Section **9.2.1.11**

9.2.1.12

Delete Section **9.2.1.12**

9.2.3.2

Amend as follows:

9.2.3.2 Sprinklers shall be permitted to be omitted where the exterior canopies, roofs, porte-cocheres, balconies, decks, and similar projections are constructed entirely with materials that are noncombustible, and where the exterior projections do not support occupancy above.

9.2.3.3

Delete section **9.2.3.3**

9.2.4.1.1

Required sprinkler coverage in all bathrooms.

9.2.4.1.1 Sprinkler protection shall be provided in all bathrooms.

9.2.4.1.1.1

New Section

9.2.4.1.1.1 Bathrooms. Sprinkler protection shall not be required in separate rooms that contain solely a toilet fixture, that contain no counters, shelving, closet doors, or other fixtures, and that have a maximum area of 55 ft^2 (5.1 m^2). Such rooms shall be surrounded by walls and doors that completely enclose the room.

9.2.4.2

Amend as follows:

9.2.4.2. Closets and Pantries. Sprinkler protection shall be provided in clothes closets, linen closets, and pantries.

9.2.6

Deleted section **9.2.6**

9.3.5.1

Added supplied by a dedicated sprinkler riser. Amend as follows:

9.3.5.1 General. Unless the requirements of 9.3.5.4 are met, where moving stairways, staircases, or similar floor openings are unenclosed and where sprinkler protection is serving as the alternative to enclosure of the vertical opening, the floor openings involved shall be protected by closely spaced sprinklers supplied by a dedicated sprinkler riser in combination with draft stops in accordance with 9.3.5.2 and 9.3.5.3.

9.3.11.1

Amend as follows:

9.3.11.1 Drop-out ceilings are not permitted to be installed beneath fire sprinklers.

9.3.11.2

Delete section **9.3.11.2 Drop-Out Ceiling and Ceiling Materials.**

9.3.11.3

Delete section **9.3.11.3 Drop-Out Ceiling and Ceiling Materials.**

9.3.11.4

Delete section **9.3.11.4 Drop-Out Ceiling and Ceiling Materials.**

9.3.11.5

Delete section **9.3.11.5 Drop-Out Ceiling and Ceiling Materials.**

9.3.19.1

Delete section 9.2.3.3 Amend as follows:

9.3.19.1 Unless the requirements of 9.2.3.2 or 9.2.3.4 are met, sprinklers shall be installed under exterior projections exceeding 4 ft (1.2 m) in width.

9.3.20.1

Required sprinkler protection in electrical rooms. Amend as follows:

9.3.20.1 Sprinkler protection shall be required in electrical equipment rooms.

9.3.21

New Sections

9.3.21 Temporary Exhibit Booths within a Permanent Building. Where sprinkler protection is required in temporary exhibit booths constructed in a permanent building, such systems shall comply with Section 9.3.21.

9.3.21.1 Hydraulic Design. Systems shall meet Density/Area Method requirements of Section 19.3.3.2 or the Pipe Schedule method of Section 27.5. The minimum design shall be for Ordinary Hazard Group 2, or higher design to accommodate the hazard within the temporary exhibit booth.

9.3.21.2 Bracing. Bracing shall not be required for temporary piping serving temporary exhibit booths.

9.3.21.3 Hangers. Hangers conforming to Section 9.3 shall be provided for temporary piping to temporary exhibit booths. Hangers shall be permitted to be attached to the temporary exhibit booth structure.

9.3.21.4 Exposed CPVC Piping. CPVC piping listed for fire protection service shall be permitted to be exposed when installed as temporary piping to serve temporary exhibit booths.

9.3.21.5 Valve. A valve and open pipe shall be provided from the most hydraulically remote point to allow for inspection of piping to prove that the piping is charged with water and void of trapped air.

9.4.3.1

Amend as follows:

9.4.3.1 * Sprinklers in light hazard occupancies, shell buildings of combustible construction, casinos, and exhibition areas shall be one of the following:

(1) Quick-response type as defined in 3.3.205.4.16
(2) Residential sprinklers in accordance with the requirements of Chapter 12
(3) Quick response CMSA sprinklers
(4) ESFR sprinklers
(5) Standard-response sprinklers used for modifications or additions, within the existing compartment, to existing systems equipped with standard-response sprinklers
(6) Standard-response sprinklers used where individual standard-response sprinklers are replaced in existing systems

10.3.6.3.2

Added exception. Amend as follows:

10.3.6.3.2 Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide.

> **Exception:** Garage overhead door within garages that service a single tenant in residential occupancies.

11.2.5.3.2

Added exception. Amend as follows:

11.2.5.3.2 Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide.

> **Exception:** Garage overhead door within garages that service a single tenant in residential occupancies.

11.3.6.3.2

Added exception. Amend as follows:

11.3.6.3.2 Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide.

> **Exception:** Garage overhead door within garages that service a single tenant in residential occupancies.

16.2.7.7.1

Added sign and font requirements. Amend as follows:

16.2.7.7.1 The list shall be on a machine-engraved metal or rigid plastic sign with capitalized lettering a minimum 14 point (1/4-inch-high) in Arial or similar font and include the following:

(1) Sprinkler Identification Number (SIN) if equipped; or the manufacturer, mode, K-factor, deflector type, thermal sensitivity, and pressure rating.
(2) General description
(3) Quantity of each type to be contained in the cabinet
(4) Issue or revision date of the list

16.3.12.1.1

New section

16.3.12.1.1 Unless hydraulically calculated, each one-inch outlet shall supply a maximum of one sprinkler head providing protection below a ceiling, and if necessary, a maximum of one head above the ceiling. Such sprinkler head(s) shall have a k-factor equal to the k-factor of existing upright sprinklers.

16.3.12.1.2

New section

16.3.12.1.2 Unless otherwise hydraulically calculated, a one-inch outlet shall be allowed to supply a maximum of two sprinkler heads where the two sprinkler heads protect areas that are physically separated by a ceiling, walls and/or doors with a minimum lintel depth of 8 in (203 mm) and maximum total area of door openings into the room of 50 ft^2 (4.6 m^2). The sprinklers shall have a K-factor equal to the k-factor upright sprinklers.

16.3.12.1.3

New section

16.3.12.1.3 When approved, sprinkler heads installed under a ceiling may have a k factor less than the overhead sprinklers, provided the occupancy hazard classification for the area under the ceiling is less than the classification that the overhead sprinklers are designed for.

16.3.12.1.4

New section

16.3.12.1.4 Flexible sprinkler hose drops shall be proven by hydraulic calculations.

16.3.12.3

New section

16.3.12.3 Unless hydraulically calculated, each one-inch outlet shall supply a maximum of one sprinkler head providing protection below a ceiling, and if necessary, a maximum of one head above the ceiling. Such sprinkler head(s) shall have a k-factor equal to the k-factor of existing upright sprinklers.

16.4.1.4

Delete section **16.4.1.4 Protection of Piping Against Freezing.**

16.4.1.4.1

Delete section **16.4.1.4.1 Protection of Piping Against Freezing.**

16.4.1.4.2

Delete section **16.4.1.4.2 Protection of Piping Against Freezing.**

16.4.1.5.1

New section

16.4.1.5.1 Design Temperature and Duration. The minimum criteria for an engineered solution in calculating heat loss for the requirement to maintain 40°F (4.4°C) shall be 0° F (-17.8°C) for 8 hours. The initial starting temperature of the water shall be no greater than 50°F (10°C).

16.9.3.3.1

Deleted methods 2 – 4. Amend as follows:

16.9.3.3.1 Valves on connections to water supplies, sectional control and isolation valves, and other valves in supply pipes to sprinklers and other fixed water-based fire suppression systems shall be electrically supervised by a Central station, proprietary, or remote station signaling service.

16.9.3.3.3

Amend as follows:

16.9.3.3.3 The requirements of 16.9.3.1.1 shall not apply to underground gate valves with roadway boxes or to valves at backflow prevention devices at the municipal water supply connection where the valves are locked in the open position.

16.9.8.5

Added last sentence. Amend as follows:

16.9.8.5 Means shall be provided downstream of all pressure-reducing valves for flow tests at sprinkler system demand. Such means shall consist of a tee outlet downstream of the pressure reducing valve identical in size to the sprinkler system feed, available for connection to field testing devices, or other method approved by the AHJ.

16.9.11

Amend as follows:

16.9.11 Floor Control Valve Assemblies.

16.9.11.1 Multistory buildings shall be provided with a floor control valve, check valve, main drain valve, and flow switch for isolation, control, and annunciation of water flow for each individual floor level.

16.9.11.2 The floor control valve, check valve, main drain valve, and flow switch required by 16.9.11.1 shall not be required where sprinkler systems protecting atriums, covered mall buildings, and other areas with non-standard ceiling heights within the building, are supplied by piping from on the protected floor system below.

16.9.11.3 - *Deleted*

16.11.2.1

Removed more than 20 sprinklers and added las sentence. Amend as follows:

16.11.2.1 Local Water Flow Alarms Units. A local waterflow alarm unit shall be provided on every sprinkler system. Such waterflow alarm units shall be installed in accordance with 16.11.2 and 7.7.

17.2.2.9.3

Amend as follows:

17.2.2.9.3 Powder-driven fasteners shall be allowed for branch lines less than or equal to 2 in. (50 mm) pipe.

17.2.2.9.4

Amend as follows:

17.2.2.9.4 Increaser couplings shall not be permitted with powder-driven studs.

17.4.1.3.3.5

New section

17.4.1.3.3.5 Where flexible sprinkler hose fittings are supported by a ceiling that does not meet design and installation criteria set forth in 17.4.1.3.3.2, such fitting shall be provided with hangers in accordance with 17.4.3.4, unless the flexible hose fitting is provided with a hanger assembly specifically approved by a Nationally Recognized Testing Laboratory for both the flexible sprinkler hose fitting and the specific method of installation.

18.5.9.3.1

Added 0.95 value. Amend as follows:

18.5.9.3.1 The value of Ss used in Table 18.5.9.3 shall be 0.95 from seismic hazard maps.

18.6.7

Amend as follows:

18.6.7 Drops and armovers less than 10 feet (3048 mm), as measured vertically, shall not require restraint. Drops and armovers of 10 feet (3048 mm) or longer, as measured vertically, shall require restraint. Horizontal portions of the pipe shall not be included when measuring pipe length to determine that restraint is required. Restraint may consist of wire wrap tied to any structural element, including ceiling tile grid, or any manner permitted by the fire code official.

19.4.4.2

Amend as follows:

19.4.4.2 The water supply to the water curtain shall be added to the water demand of the hydraulic calculations and be balanced to the calculated area demand.

19.6

New section

19.6 NONSTORAGE OCCUPANCIES WITH HIGH CEILINGS

19.6.1 Light and Ordinary Hazard Group 1 and 2 Occupancies with ceiling heights between 25 and 50 feet. Light and Ordinary Hazard 1 and 2 occupancies shall be designed to provide a minimum density of 0.10 gpm/ft^2, 0.15 gpm/ft^2 and 0.20 gpm/ft^2 respectively. The minimum design area shall be equal to the ceiling height times 100. The sprinkler system shall utilize listed quick response sprinklers with a K-factor of 11.2 or greater. The maximum sprinkler discharge pressure allowed is 30 psi.

19.6.2 Non-storage occupancies with ceiling heights over 50 feet. All structures, regardless of occupancy or hazard classification, with ceiling heights exceeding 50'-0", require a design analysis from a licensed Fire Protection Engineer. This analysis must be submitted to the Authority Having Jurisdiction for review and approval prior to the start of construction. Deluge systems shall be installed using sprinklers with a minimum k-factor of 11.2 with a maximum sprinkler discharge pressure of 30 psi.

19.6.3 Extra Hazard Occupancies with ceiling height over 25 feet. Extra Hazard occupancies with ceiling heights over 25 feet require a design analysis from a licensed Fire Protection Engineer. This analysis must be submitted to the Authority Having Jurisdiction for review and approval prior to the start of construction.

19.6.4 Exhibition Spaces and Stages with Fly Galleries. For design criteria for Exhibition Spaces and Stages with Fly Galleries, see Section 11.3.5.

19.7

New Section

19.7 SPRINKLER PROTECTION FOR EXHIBITION SPACES AND STAGES WITH FLY GALLERIES

19.7.1 Exhibition Spaces and Stages with Fly Galleries with ceiling heights up to 35 feet. Sprinkler systems protecting exhibition spaces and stages with fly galleries with ceiling heights up to 35 feet shall be designed to provide a minimum density of 0.30 gpm/ft^2. The minimum design area shall be 2,500 square feet. The sprinkler system shall utilize standard coverage quick response sprinklers with a k-factor of 8.0 or greater. The maximum sprinkler discharge pressure allowed is 30 psi. A hose stream demand of 500 gpm shall be provided.

19.7.2 Exhibition Spaces and Stages with Fly Galleries with ceiling heights between 35 and 60 feet. Sprinkler systems protecting exhibition spaces and stages with fly galleries with ceiling heights between 35 and 60 feet shall be designed to provide a minimum density of 0.45 gpm/ft^2. The minimum design area shall be 2,500 square feet. The sprinkler system shall utilize standard coverage quick response sprinklers with a k-factor of 11.2 or greater. The maximum sprinkler discharge pressure allowed is 30 psi. A hose stream demand of 500 gpm shall be provided.

19.7.3 Exhibition Spaces and Stages with Fly Galleries ceiling heights over 60 feet. Exhibition spaces and stages with fly galleries with ceiling heights exceeding 60'-0", require a design analysis from a licensed Fire Protection Engineer. This analysis must be submitted to the Authority Having Jurisdiction for review and approval prior to the start of construction. Deluge systems shall be installed using standard coverage sprinklers with a minimum k-factor of 11.2 with a maximum sprinkler discharge pressure of 30 psi. A hose stream of 500 gpm shall be provided.

26.15.2.2.1.3.1

New section

26.15.2.2.1.3.1 Chute Sprinkler Supply. Sprinkler serving chutes shall be on separate dedicated supply risers.

26.37

New sections

26.37 Protection Matrix for IBC Group R Division 3 Occupancies and buildings built under the IRC.

26.37.1 General. When a sprinkler system is being installed, the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, for a IBC Group R Division 3 Occupancy and buildings built under the IRC, the design requirements in Table 26.37.1 shall be applied.

Table 26.37.1 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC[4]					
Building Area SIZE RANGE [6]	RESIDENTIAL SYSTEM TYPE[1,3]	SEPARATE SPRINKLER LEAD-IN REQUIRED [5]	MINIMUM UNDERGROUND PIPE SIZE [5]	MINIMUM WATER METER SIZE[7]	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
<3,600 sq ft	Standard NFPA 13D [2]	See NFPA 13D for design requirements.			
≥3,600 sq ft & <10,000 sq ft	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements			
≥10,000 sq ft & <15,000 sq ft	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
≥ 15,000 sq ft	Modified NFPA 13 [1]	Yes	N/A	N/A	Yes

N/A = Not Applicable

1. This constitutes a building "protected with an approved fire sprinkler system" per the IFC.
2. Domestic demand of 5 gpm is required to be added to the sprinkler demand in the hydraulic calculations.
3. Free-standing detached buildings with one or more sleeping rooms shall be protected by a minimum Enhanced NFPA 13D system.
4. Excluding Group Care Homes.
5. U.G. lead-in shall be the minimum size required hydraulically as proven by the sprinkler contractor and shall be hydrostatically tested and flushed, witnessed by the fire dept.
6. Building area is defined as all areas under roof except for porches, patios, balconies, carports and porte cocheres.
7. Water meters used for residential sprinkler systems shall be residential fire service meters or other meters approved by the water purveyor.

26.37.2 Modified 13 Design Criteria. When Table 22.38.1 requires a Modified 13 Design, the sprinkler system shall be installed to meet the requirements of this code, with the exception of the following items, as required by the AHJ:

1. **Fire Department Connections (FDC):** A 2½-inch fire department connection is required. A single snoot connection will be accepted. The FDC shall be located on the garage wall facing the street except for special circumstances where the FDC may be freestanding and located adjacent to the street or private drive. A freestanding FDC in these circumstances may be designed into the mailbox column.
2. **Riser Room:** Risers shall be located in either the garage or within a dedicated room with an exterior door. Provided the garage/room is fully insulated the requirement for maintaining 40°F will not require a source of heat.
3. **Inspectors Test Connection:** The inspectors test location may be piped off the system riser.
4. **Piping in locations less than 40°F:** Dry pipe systems are not permitted for the protection of living spaces, anti-freeze systems shall be used. The protection of non-living spaces such as attics may be protected by dry-pipe systems.
5. **Anti-Freeze Loops:** The capacity shall not exceed 80 gallons.
6. **Separate Water Supply:** A separate water lead-in for the fire sprinkler system along with an approved (by the local water authority) back-flow prevention device is required. The back-flow prevention device shall be located at the street with in an approved insulated enclosure. The lead-in shall be sized using the minimum pipe size available that provides the calculated flow.

7. **Control Valves:** All valves used to control the sprinkler system are required to be indicating. A Post Indicator Valve (PIV) is not permitted.
8. **Electrical Supervision:** When required by the *fire code official*, the main control valves shall be electrically supervised. The back-flow valves are not required to be electrically supervised.
9. **Fire Pumps:** Electric fire pumps normally accepted in NFPA –13D systems for residential use (UL listed jockey pump) are acceptable.
10. **Notification Devices:** Interior – One (1) interior horn/strobe shall be installed in a location specified by the homeowner. Exterior – One (1) exterior horn/strobe shall be located above the FDC or other acceptable location. The sprinkler flow switch shall activate both of the required devices.
11. **Residential Sprinkler Heads:** Residential sprinkler heads shall be utilized and the design allowances specified in section 11.2.3.2.3.1 (reduction to design area) may be applied.
12. **Hangers and Earthquake Bracing:** The hanging of sprinkler pipe shall be in accordance Chapter 9. Earthquake bracing is not required.
13. **Garages:** Garages shall be protected as specified in NFPA 13R section 7.3 'Design Criteria – Garages'.
14. **Location of Sprinklers:** Sprinklers shall be installed in all areas except where omissions are permitted as follows:
    a. Inaccessible attic spaces.
    b. Exterior overhangs, porches, and carports.
    c. Rooms not provided with environmental control.
    d. Showers, saunas, steam rooms or other areas that would necessitate the installation of corrosion proof heads.
    e. Unconditioned spaces such as storage rooms or exterior accessible spaces that are subject to freezing.

26.37.3 Other Protection Designs: For the other protection designs listed in Table 22.38.1, see the respective revised codes for NFPA 13D and NFPA 13R design requirements.

27.2.1.7

New section

27.2.1.7 The maximum velocity for use in hydraulic calculations shall be 32 ft/sec (9.8 m/sec).

27.2.1.8

New section

27.2.1.8 Hydraulically calculated fire sprinkler systems shall be designed to ensure the required system pressure is a minimum of ten (10) psi below the available supply pressure.

28.5.1

Amend as follows:

28.5.1 The installing contractor shall identify a hydraulically designed sprinkler system with a machine-engraved weatherproof metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font secured to the riser it serves with corrosion-resistant wire, chain, or other means approved by the AHJ. Such signs shall be placed at the alarm valve, dry pipe valve, preaction valve, or deluge valve supplying the corresponding hydraulically designed area. Signs located at the system control riser shall be allowed to be combined with the General Information Sign described in 28.6.

28.6.1.1

Amend as follows:

28.6.1.1 Such general information shall be provided with a machine-engraved weatherproof metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font, secured with corrosion resistant wire, chain, or other acceptable means.

28.6.1.2 Such signs shall be placed at each system control riser, antifreeze loop, and auxiliary system control valve. Signs located at the system control riser shall be allowed to be combined with the Hydraulic Design Information Sign described in 25.5.

NFPA 13D

4.4

Deleted base code. New verbiage. Amend as follows:

4.4 Working Plans

Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor, and shall show those items from the following list that pertain to the design of the system:

1. Name of owner.
2. Location, including street address.
3. Point of compass.
4. Full height cross section.
5. Ceiling/roof heights and slopes not shown in the full height cross section.
6. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
7. Name and label for each area or room.
8. For systems supplied by city mains, location, and size of city main in street, and location, size, and type of domestic line, including length to city connection, and water meter location and size. Static and residual hydrants that were used in flow tests shall be shown. The location of the 5 gpm domestic demand shall be indicated.
9. Make, type, model, temperature rating, nominal K-factor, and number of each type of sprinkler, including sprinkler identification number.
10. Pipe type and schedule of wall thickness.
11. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
12. Location and size of riser nipples and drops.
13. Type of fittings and joints.
14. Type and locations of hangers, and methods of securing sprinklers when applicable.
15. Location and size of all valves and drainpipes.
16. Location and size of water gauges.
17. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
18. A summary of the hydraulics, including the static pressure, residual pressure, and flow of the water supply, the pressure and flow demands at the point of connection to the water supply, and the pressure and flow demands at the bottom of the system riser.
19. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
20. Relative elevations of sprinklers, junction points, and supply or reference points.
21. A graphic representation of the scale used on all plans.
22. Name, address, phone number, and contractor's license number of contractor.

23. Nevada State Fire Marshal registration number.
24. Signature and NICET number, or engineer's seal, of the designer.
25. Indicate by note the minimum rate of water application per sprinkler head, the maximum spacing for each head, and the domestic demand.
26. Information about antifreeze solution used. Indicate the type of antifreeze used, the amount of antifreeze in the system, and information about antifreeze compatibility with the pipe.
27. General notes as required by the AHJ.
28. Edition year of NFPA 13D to which the sprinkler system is designed.
29. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

6.2.3.1

Deleted permitted and added required. Amend as follows:

6.2.3.1 The control valve shall be required to serve the domestic water supply.

6.3.1

Revised section to include 6.6.8. Amend as follows:

6.3.1 A multipurpose piping system shall be installed in accordance with 6.3.2 through 6.6.8

6.5

Title of section changed. Added language regarding applicability of system, and check valve requirements. Amend as follows:

6.5 Passive Purge Multipurpose Systems. Passive purge multipurpose systems shall supply a minimum of one toilet fixture. These systems may be used both with a single-outlet meter or a dual-outlet water meter, which may be required by the water purveyor. Such systems shall be considered acceptable by this standard where designed in accordance with 6.5.1 through 6.5.8.

6.5.1 An accessible check valve shall be installed on the fire sprinkler riser to maintain system pressure.

6.5.2 (*No Change*)

6.5.3 Where a single-outlet meter is provided, a common underground supply for both domestic and fire sprinkler needs is permitted. No separate control valve controlling only the fire sprinkler system shall be permitted. The domestic supply shall serve all domestic fixtures except for the toilet in the master bathroom.

6.5.4 Where a dual-outlet meter is provided, the fire sprinkler system shall be piped separately from the domestic system starting at the discharge side of the water meter. There shall be no separate control valve that controls only the fire sprinkler system (See UDACS for details). The domestic supply shall serve all hot water fixtures, and all cold-water fixtures except for the toilet in the master bathroom.

6.5.5 The installation of a backflow preventer, water treatment and filtration device, or a pressure reducing valve between the water meter and the fire sprinkler system is prohibited.

6.5.6 The fire sprinkler system piping shall be designed as a looped system, with vertical and horizontal looping, in a manner that water circulates throughout the system. Dead-end supply lines off the loop to individual sprinkler heads shall be permitted where each individual dead end does not exceed 50 feet in total length.

6.5.7 A supply line from the sprinkler system loop shall feed into the toilet in the master bathroom.

6.5.8 A pressure gauge shall be installed on the supply side of the check valve.

6.6

New Section

6.6 Network Multipurpose Systems. Network multipurpose systems shall provide supply for all interior domestic fixtures and fire sprinkler needs. This design may be used with a single-outlet meter but is prohibited from use with a dual-outlet meter, which may be required by the water purveyor. Such systems shall be considered acceptable by this standard where designed in accordance with 6.6.1 through 6.6.8

6.6.1 In common water supply connections serving more than one dwelling unit, 5 gpm (19 L/min) shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler.

6.6.2 Where a single-outlet meter is provided, a common underground supply for both domestic and fire sprinkler needs is required. No separate control valve controlling only the fire sprinkler system shall be permitted. The network system shall serve all cold-water domestic fixtures served by the water softener loop and all fire sprinklers.

6.6.3 Where a dual-outlet meter is provided, the use of a network system is prohibited. System design shall be in accordance with 6.5.

6.6.4 The fire sprinkler system piping shall be designed as a networked system, with interconnection of all domestic fixtures and fire sprinkler heads, in a manner that water circulates throughout the system when any domestic fixture is flowing. Dead-end supply lines shall only be permitted to supply domestic fixtures.

6.6.5 Where required by the *fire code official*, networked systems shall be performance tested to prove one-head and two-head flow scenarios, in addition to other inspections and approvals required by this code. Testing shall replicate the effect of devices that restrict flow and pressure, such as water filtration systems, water softeners and pressure reducing valves.

6.6.6 A warning sign, with minimum ¼ in. (6.4 mm) letters, shall be affixed adjacent to the main shutoff valve and state the following:

> **Warning:** The water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign.

6.6.7 Where water treatment and filtration loops are installed, the network sprinkler design shall incorporate one of the following conditions:

1. The flow restriction and pressure loss through the water treatment equipment shall be considered in the hydraulic calculations.
2. An automatic bypass shall be installed around the water treatment equipment that directs all water directly to the system.

6.6.8 A pressure gauge shall be installed on the supply side of the dwelling unit control valve in the garage or other accessible location. Where a pressure reducing valve is installed after the control valve, the pressure gauge shall be installed on the outlet side of the pressure reducing valve.

7.1.1

Removed a separate shutoff and required a single control valve. Amend as follows:

7.1.1 A single control valve arranged to shut off both the domestic system and the sprinkler system shall be installed.

7.1.2

Deleted supervision and additional methods of supervising control valve. Amend as follows:

7.1.2 The sprinkler system piping shall not have a separate control valve installed.

7.5.6.1.1

New section

7.5.6.1.1 Temperature ratings for sprinklers stored or installed in unconditioned environments where the maximum ambient temperature exceeds 100ºF (38ºC) shall comply with 7.5.6.2.

7.7

Changed title of section from Attics. Requirements consistent with the IECC. Amend as follows:

7.7 Unconditioned Spaces. When nonmetallic piping is installed in unconditioned spaces, the piping shall be insulated or covered with insulation to a minimum of R-2 level. Insulation shall be provided on the unconditioned space side of the piping to avoid exposure of the piping to temperatures in excess of the pipe's rated temperature.

8.1.3.1.2

Added verbiage after limitations. Amend as follows:

8.1.3.1.2 Where construction features or other special conditions exist that are outside the scope of sprinkler listings, listed sprinklers shall be permitted to be installed beyond their listing limitations, provided the installation conforms to a modification or alternative materials and methods report that has been approved by the authority having jurisdiction.

8.3.4

Added exception. Amend as follows:

8.3.4* Sprinklers shall not be required in garages, open attached porches, carports and similar structures.

Exception

1. Attached garages with any habitable rooms above shall be required to be protected with fire sprinklers.

8.4

New Section

8.4 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC

8.4.1 General. When a sprinkler system is being installed , the design requirements in Table 8.4 shall be applied.

Table 8.4 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC[4]

Building Area Size Range [6]	Residential System Type[1,3]	Separate Sprinkler Lead-in Required [5]	Minimum Underground Pipe Size [5]	Minimum Water Meter Size[7]	Sprinklers Required In Areas Subject To Freezing.
< 3,600 sq.ft.	Standard NFPA 13D [2]	No	1"	¾"	No
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	No	1"	¾"	No
> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
>15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements			

N/A = Not Applicable

1. This constitutes a building "protected with an approved fire sprinkler system" per the IFC.
2. Domestic demand of 5 gpm is required to be added to the sprinkler demand in the hydraulic calculations.
3. Free-standing detached buildings with one or more sleeping rooms shall be protected by a minimum Enhanced NFPA 13D system.
4. Excluding Group Care Homes.
5. U.G. lead-in shall be the minimum size required hydraulically as proven by the sprinkler contractor and shall be hydrostatically tested and flushed, witnessed by the fire dept.
6. Building area is defined as all areas under roof except for porches, patios, balconies, carports and porte cocheres.
7. Water meters used for residential sprinkler systems shall be residential fire service meters or other meters approved by the water purveyor.

8.4.2.1 Where required. When Table 8.4 requires an Enhanced 13D design, sprinklers shall be installed throughout the structure except where omissions are permitted by the following:

1. Unheated attic spaces.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.
4. Exterior overhangs, porches, and carports
5. Showers, saunas, steam rooms or other areas that would necessitate the installation of corrosion proof heads.
6. Unconditioned spaces such as storage rooms or exterior accessible spaces that are subject to freezing.

8.4.3 Other Protection Designs. For other protection designs listed in Table 8.4, see the respective revised codes for NFPA 13 and NFPA 13R minimum design requirements.

12.1

Added last sentence. Amend as follows:

12.1 The installer shall provide to the owner/occupant instructions on inspecting, testing, and maintaining the system. This shall include a copy of the approved fire sprinkler shop drawings.

NFPA 13R

1.1

Changed stories from four to two. Added last sentence. Amend as follows:

1.1 Scope This standard shall cover the design and installation of automatic sprinkler systems for protection against fire hazards in residential occupancies up to and including two stories in height in buildings not exceeding 60 ft (18 m) in height above grade plane. Residential occupancies three or more stories in height shall be protected throughout in accordance with NFPA 13.

5.1.3

Added last sentence. Amend as follows:

5.1.3 Rated Pressure. System components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 175 psi (12.1 bar) for components installed aboveground and 150 psi (10.4 bar) for components installed underground between the water supply and the system riser. When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 305), or 50 psi greater than the system design pressure, whichever is greater.

5.4.2

Deleted method 5 for heat tracing. Amend as follows:

5.4.2* Systems in Areas Subject to Freezing. Where any portion of a system is subject to freezing and the temperature cannot be maintained reliably at or above 40 F (4 C), the pipe shall be protected by use of one of the following methods:

(1)* Antifreeze system using a listed antifreeze solution in accordance with NFPA 13.
(2) Dry Pipe System
(3) Preaction System
(4) Listed dry pendent, dry upright, or dry sidewall sprinklers extended from pipe in heated areas

6.4.4

Added verbiage from provided. Amend as follows:

6.4.4 Where construction features or other special conditions exist that are outside the scope of sprinkler listings, listed sprinklers shall be permitted to be installed beyond their listing limitations, provided the installation conforms to a modification or alternative materials and methods report that has been approved by the authority having jurisdiction.

6.6.4

Added containing fuel-fired equipment. Amend as follows:

6.6.4 Sprinklers shall be installed in any closet used for heating and air-conditioning equipment, washers, dryers, water heaters, or containing fuel-fired equipment.

6.6.7

Added and do not contain fuel-fired equipment. Amend as follows:

6.6.7 Sprinklers shall not be required in closets (regardless of size) on exterior balconies and exterior breezeways/corridors, regardless of size, as long as the closet does not have doors or unprotected penetrations directly into the dwelling unit and do not contain fuel-fired equipment.

6.7.2.1.

Removed heat tracing. Amend as follows:

6.7.2.1* Freezing. Where aboveground water-filled supply pipes, risers, system risers, feed mains, or branch lines pass through open areas, cold rooms, passageways, or other areas exposed to freezing temperatures, the pipe shall be protected against freezing by insulating coverings, frost proof casings, or other reliable means capable of maintaining a minimum temperature between 40 F and 120 F (4 C and 48.9 C) (see also 5.4.2).

6.7.2.2.1

Delete **Section 6.7.2.2.1**

6.7.2.2.1.1

Delete **Section 6.7.2.2.1.1**

6.7.2.2.2

Delete **Section 6.7.2.2.2**

6.7.2.2.3

Delete **Section 6.7.2.2.3**

6.7.2.3.2

Added corrosion resistance ratio. Amend as follows:

6.7.2.3.2 Where water supplies are known to have unusual corrosive properties and threaded or cut-groove steel pipe is to be used, wall thickness shall be in accordance with Schedule 30 [in sizes 8 in. (200 mm) or larger] or Schedules 40 [in sizes less than 8 in. (200 mm)]. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

6.8.2

Removed methods 2 and 3. Amend as follows:

6.8.2 The sprinkler system piping shall not have a separate control valve installed unless supervised by a central station, proprietary, or remote station alarm service.

6.15

Delete Section **6.15**

7.5

New section

7.5 Protection Matrix for Group R Division 3 Occupancies. When a sprinkler system is being installed the design requirements in Table 7.5 shall be applied.

Table 7.5 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC[4]

Building Area SIZE RANGE [6]	Residential SYSTEM TYPE[1,3]	SEPARATE SPRINKLER LEAD-IN REQUIRED [5]	MINIMUM UNDERGROUND PIPE SIZE [5]	MINIMUM WATER METER SIZE[5]	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
< 3,600 sq.ft.	Standard NFPA 13D [2]	See NFPA 13D for design requirements			
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements			
> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	Yes	N/A	N/A	Yes
> 15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements			

N/A = Not Applicable

1. This constitutes a building "protected with an approved fire sprinkler system" per the IFC.
2. Domestic demand of 5 gpm is required to be added to the sprinkler demand in the hydraulic calculations.
3. Free-standing detached buildings with one or more sleeping rooms shall be protected by an Enhanced NFPA 13D system.
4. Excluding Group Care Homes.
5. U.G. lead-in shall be the minimum size required hydraulically as proven by the sprinkler contractor and shall be hydrostatically tested and flushed, witnessed by the fire dept.
6. Building area is defined as all areas under roof except for porches, patios, balconies, carports and porte cocheres.

7.5.1 Enhanced 13R Design. When Table 7.5 requires an Enhanced 13R design, the sprinkler system shall be designed and installed in accordance with NFPA 13R, except that sprinklers shall be installed throughout the structure except where omissions are permitted by the following:

1. Unheated attic spaces that do not contain fuel fired equipment.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.
4. Showers, saunas, steam rooms or other areas that would necessitate the installation of corrosion proof heads.
5. Unconditioned spaces such as storage rooms or exterior accessible spaces that are subject to freezing.

7.5.2 Other Protection Designs. For other protection designs listed in Table 7.5, see the respective revised codes for NFPA 13 and NFPA 13D minimum design requirements.

8.1.7

Added 38-43 and amended some language. Amend as follows:

8.1.7 Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor, and shall show those items from the following list that pertain to the design of the system:

(1) Project name/name of owner and occupant
(2) Location, including street address
(3) Point of compass
(4) Ceiling construction
(5) Full height cross-section or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping
(6) Ceiling/roof heights and slopes not shown in the full height cross section
(7) Location of partitions and fire walls, including lintels and doorways. Lintel openings require a cross section view to indicate the area of the opening
(8) Location and size of concealed spaces, attics, closets, and bathrooms
(9) Any small enclosures in which no sprinklers are to be installed
(10) Size of city main in street and the city main test results including elevation of the test hydrant. Indicate whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main
(11) Make, manufacturer, model, type, temperature rating, sprinkler identification number, nominal K-factor and orifice size of the sprinkler, and the quantity of each sprinkler installed
(12) Type and location of high-temperature sprinklers
(13) Number of sprinklers on each riser, per floor
(14) Type and location of horn/strobes
(15) Type of pipe and fittings
(16) Pipe type and schedule of wall thickness
(17) Type of protection for nonmetallic pipe
(18) Location and size of riser nipples
(19) Type of fittings and joints and the location of all welds and bends
(20) Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable
(21) All control valves, check valves, drainpipes, and test connections
(22) Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
(23) Name, address, phone number, and contractor's license number of sprinkler contractor
(24) Nominal pipe size with lengths shown to scale
(25) Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
(26) A graphic representation of the scale used on all plans
(27) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets
(28) The minimum rate of water application and the design area of water application
(29) The total quantity of water and the pressure required noted at a common reference point for each system. For hydraulically designed systems, the information on the hydraulic data nameplate
(30) Relative elevations of sprinklers, junction points, and supply or reference points
(31) Information about backflow preventers (manufacturer, size, type)
(32) Information about antifreeze solution used (type and amount)
(33) Size and location of hydrants, showing size and number of outlets; static and residual hydrants that were used in flow tests or models shall be shown
(34) Size, location, and piping arrangement of fire department connections
(35) Location of fuel-fired equipment and heating and air-conditioning equipment
(36) Locations of closets on exterior balconies, and any doors or penetration between the closet and the dwelling unit
(37) Edition year of NFPA 13R to which the sprinkler system is designed
(38) Occupancy, label, and name for each area or room

(39)Make, type, model, and size of alarm or dry pipe valve
(40)Approximate capacity in gallons of each dry pipe system
(41)Nevada State Fire Marshal registration number
(42)Signature and NICET number, or engineer's seal, of the designer
(43)General notes as required by the AHJ

NFPA 14

4.2.3.2

New section

4.2.3.2 Where system pressures exceed 300 psi, piping expected to experience greater than 300 psi at zero flow shall be rated for the pressures expected and have minimum nominal pipe wall thickness in accordance with Schedule 40.

4.6.1.1.1

Added 6 in clearance. Amend as follows:

4.6.1.1.1 Within the cabinet, the hose connections shall be located so that there is at least 2 in. (50 mm) between any part of the cabinet, other than the door and the handle of the valve when the valve is in any position ranging from fully open to fully closed, and 6 in (150 mm) clearance around the circumference of outlet/cap to any part of the cabinet.

4.8.5

New section

4.8.5 Fire Department Connections shall be provided with internal check valve(s) such that water being supplied to any inlet will not flow back out of any other inlet. For the purposes of this section, internal clapper valve devices provided by the manufacturer in listed Fire Department Connections shall be considered internal check valves.

6.3.2.1

New section

6.3.2.1 Individual hose valves fed from the feed main shall each be provided with an isolation valve, such that maintenance of the individual hose valve can be accomplished without interrupting the supply to standpipes fed from the feed main.

6.3.7.1

Removed methods 1-4. Amend as follows:

6.3.7.1. System water supply valves, isolation control valves, and other valves in feed mains shall be electrically supervised in an approved manner in the open position by a central station, proprietary, or remote station signaling service.

6.4.5.3.1

New section.

6.4.5.3.1 Signs shall have a red background and be professionally engraved with white lettering a minimum of 1 in. (25.4 mm) in height, with a minimum stroke of ¼ in. Signs shall consist of durable, weatherproof materials, subject to approval by the authority having jurisdiction.

7.2.3.2

Changed psi from 175 to 200. Amend as follows:

7.2.3.2 Where the static pressure at a 2½ in. (65mm) hose connection exceeds 200 psi (13.9 bar), a listed pressure regulating device shall be provided to limit static and residual pressures at the outlet of the hose connection to no more than 200 psi (13.9 bar)

7.2.3.4

New section

7.2.3.4 Where hose valve pressure regulating devices are installed on 2 ½ in. (65 mm) outlets, they shall be field adjustable, capable of being adjusted through the full adjustment range by a 3/8 in. (12 mm) rod with a maximum required torque of 30 foot-pounds (41 nm) while flowing water. Field adjustment shall not require any hose valve disassembly.

7.3.2.10

Removed base code and added 100 feet of hose and 30 feet of stream. Amend as follows:

7.3.2.10 Additional hose connections shall be provided in unsprinklered buildings so that all floor areas of the floor or story are protected by hose valve coverage, with travel distance limited to 100 feet of hose and 30 feet of stream from each hose valve connection.

7.3.2.11

Removed base code and added 100 feet of hose and 30 feet of stream Amend as follows:

7.3.2.11 Additional hose connections shall be provided in buildings sprinklered in accordance with NFPA 13 or NFPA 13R so that all floor areas of the floor or story are protected by hose valve coverage, with travel distance limited to 100 feet of hose and 30 feet of stream from each hose valve connection.

7.3.3.1

Amend as follows:

7.3.3.1 Class II systems shall be provided with 1½ in. (40 mm) hose stations so that all portions of each floor level of the building or area thereof required to be protected, are within 130 ft (39.7 m) of a hose connection provided with 1½ in. (40 mm) hose.

7.4

Added sentence with scissor stairs. Amend as follows:

7.4 Number of Standpipes. Separate standpipes shall be provided in each required exit stairway. Scissor stairs having two separate landings on each level shall be provided with a separate hose connection on each stair landing.

7.8.1

Changed 100 psi to 125 psi. Amend as follows:

7.8.1 Minimum Design Pressure for Hydraulically Designed Systems. Hydraulically designed standpipe systems shall be designed to provide the waterflow rate required by Section 7.10 at a minimum residual pressure of 125 psi (8.6 bar) at the outlet of the hydraulically most remote 2 ½ in. (65 mm) hose connection and 65 psi (4.5 bar) at the outlet of the hydraulically most remote 1 ½ in. (40 mm) hose station.

7.11.1.1.1

Amended to require on every floor, with pressure regulating devices. Amend as follows:

7.11.1.1.1 The drain riser connections shall be located on every floor with a hose valve pressure-regulating device. A drain connection shall be provided adjacent to every hose valve pressure-regulating device, even if the pressure-regulating device is not on a vertical standpipe riser.

11.5.5.1.2

New section

11.5.5.1.2 A permanent sign, engraved on metal, shall be posted on the Pressure Reducing Station showing the system set inlet and outlet pressures and flow of the device.

12.7.2

Added unless otherwise approved by authority having jurisdiction. Amend as follows:

12.7.2 Where temporary standpipes normally contain water, the piping shall be protected against freezing, unless otherwise approved by the authority having jurisdiction.

NFPA 20

4.2.1.1

New section

4.2.1.1 When selecting a fire pump the designer may utilize the portion of the pump curve between 90 and 140 percent of the rated capacity based on system demand. The net pump shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, shall not exceed the pressure for which the system components are rated. Fire pumps shall be sized to supply the most demanding system without oversizing the fire pump.

4.12.1.1

Removed standard gauges for liquid filled. Amend as follows:

4.12.1.1 A liquid filled pressure gauge having a dial not less than 3.5 in. (89 mm) in diameter shall be connected near the discharge casting with a 0.25 in. (6 mm) gauge valve.

4.12.2.1

Removed standard gauges for liquid filled . Amend as follows:

4.12.2.1 Unless the requirements of 4.12.2.4 are met, a liquid filled gauge having a dial not less than 3.5 in. (89 mm) in diameter shall be connected to the suction pipe near the pump with a 0.25 in. (6 mm) gauge valve.

4.16.4.1

Amend as follows:

4.16.4.1 All pumps supplied by municipal water supply shall be installed with a bypass. *(See Figure A.4.15.4.)*

9.3.4

Amended number 2. Amend as follows:

9.3.4 When provided, the alternate source of power shall be supplied from one of the following sources:

(1) Unchanged

(2) One of the sources identified in 9.2.2(1), 9.2.2(2), 9.2.2(3), or 9.2.2(5) where the power is provided distinctly independent of the normal source of power. Any connections to the public utility shall be considered a single source of power and subsequently cannot be utilized as both normal power and the alternate (backup) power.

10.2.1

Added the last sentence. Amend as follows:

10.2.1 Controllers shall be located as close as is practical to the motors they control and shall be within sight of the motors. Controllers shall be readily accessible and have clear access to the entrance to the room.

10.4.7.1.1

New section

10.4.7.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

12.2.1

Added last sentence. Amend as follows:

12.2.1 Controllers shall be located as close as is practical to the motors they control and shall be within sight of the motors. Controllers shall be readily accessible and have clear access to the entrance to the room.

12.4.2.1.1

New section

12.4.2.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

NFPA 22

5.2..1

Changed AWWA D107 to D103. Amend as follows:

5.2.1 All tank foundations, materials, accessories, fabrication, construction, and welding shall be in accordance with AWWA D100 or AWWA D103.

14.4.1

Added the last sentence. Amend as follows:
14.4.1 A permanent pipe connected to a water supply shall be provided to fill the tank, except as provided in 14.4.1.1. Where the tank serves as a break tank between the city supply and fire pump(s), the fill shall be through automatic fill valves that are tied to water level sensors, and a bypass line of equal size with a normally closed control valve shall be provided.

14.4.2

Added the las sentence. Amend as follows:

14.4.2 The means to fill the tank shall be sized in accordance with 4.2.1.4. Where the tank serves as a break tank between the city supply and building fire pump(s), the means to fill the tank shall be automatic and shall provide supply flow equal to 150% of the fire pump rated flow.

14.6.1.1

New section

14.6.1.1 Discharge. The overflow pipe shall discharge water to a drain with flow capacity equal to or greater than the fill line supply flow, or to an approved exterior location subject to approval by the authority having jurisdiction.

14.9.1.1

New section

14.9.1.1 Where the water storage tank acts as a break tank between the city supply and fire pump(s), water level sensors shall be provided. A minimum of three sensor levels shall be provided. Two sensor levels shall activate the turn-on/turn-off of the fill valve. The third sensor level shall indicate a low-level alarm. The sensor that opens the fill control valve shall be set 5 inches (127 mm) below normal (full) level, or at 90% of the normal (full) volume, whichever leaves the greater volume in the tank. The sensor that closes the fill control valve shall be set at normal (full) level. The sensor that signals a low alarm shall be set 12 inches (300 mm) below normal (full) level, or at 70% of the normal (full) volume, whichever leaves the greater volume in the tank. The low-level alarm shall be transmitted to a constantly attended location to initiate response to the fill control bypass valve.

NFPA 24

6.6.1

Changed six to two. Amend as follows:

6.6.1 Sectional valves shall be provided at appropriate locations with piping sections such that the number of fire protection connections between sectional valves does not exceed two.

6.6.2

Added number 3. Amend as follows:

6.6.2 A sectional valve shall be provided at the following locations:

(1) Unchanged

(2) Unchanged

(3) On the underground line where there are two sources of water, after every 2 fire hydrants or building fire sprinkler connections

NFPA 72

7.2

Amend as follows:

7.2* Minimum Required Documentation. (SIG-FUN)
7.2.1* Where documentation is required by the authority having jurisdiction, the following list shall represent the minimum documentation required for new systems and additions or alterations to existing systems:
(1)* Written narrative providing intent and system description.
(2) Riser diagram
(3) Floor plan layout showing locations of all devices, control equipment, and supervising station and shared communications equipment with each sheet showing the following:
- (a) Point of compass (north arrow)
- (b) A graphic representation of the scale used with 1/8" as the minimum scale unless approved.
- (c) Room use identification (e.g., room name and number)
- (d) Building features that will affect the placement of initiating devices and notification appliances
- (e) Reflected ceiling plan when ceiling mounted detectors are used
- (f) Ceiling height(s) and appliance mounting height(s) when ceiling mounted notification appliances are used
- (g) Ambient environmental conditions (e.g., temperature, humidity, etc.) that will affect the operation of control equipment, initiating devices or notification appliances, when required by the AHJ.

(4) Sequence of operation in either an input/output matrix or narrative form.
(5) Equipment technical data sheets
(6) Manufacturers' published instructions, including operation and maintenance instructions
(7) Battery capacity and safety margin calculations (where batteries are provided)

(8) Voltage drop calculations for notification appliance circuits
(9) Mounting height elevation for wall-mounted devices and appliances
(10) Where occupant notification is required, minimum sound pressure levels that must be produced by the audible notification appliances in applicable covered areas. Provide a chart showing areas where the ambient sound levels exceed 65dB where public mode is used and all the ambient sound levels for all areas where private mode is used.
(11) Locations of alarm notification appliances, including candela ratings for visual alarm notification appliances
(12)* Pathway diagrams between the control unit and shared communications equipment within the protected premises
(13) Completed record of completion in accordance with 7.5.6 and 7.8.2
(14) Intelligibility floor plans when required by the AHJ, must indicate graphically and in tabular form each acoustically distinguishable space (ADS) as described in Annex D. The ADS's and areas to be tested for intelligibility shall be approved by the AHJ.
(15) AHJ notes.

10.4.4

Changed 15 inches to 3 feet. Amend as follows:

10.4.4. Unless otherwise permitted by the authority having jurisdiction, control unit displays, visible indicators, or controls shall be mounted such that the distance to the highest switch, lamp, or textural display does not exceed 6 ft (1.8m) above the finished floor, and the lowest switch, lamp, or textual display shall not be less than 3 ft (0.914m) above the finished floor.

10.4.6

New section

10.4.6. Smoke or heat detector(s) shall not be required to be installed at the location of dedicated function fire alarm control unit(s) and/or dedicated function sprinkler monitoring systems.

12.3.3

Amend as follows:

12.3.3* Class C. The installation of all pathway wiring, cable and equipment shall be in accordance with *NFPA 70, National Electric Code* and the applicable requirements of 12.2.3.1 through 12.2.3.4. In all occupancies, other than residential two stories or less, all wiring, including optical fiber cables, shall be in enclosed metallic conduit or shall be MI, MC, or AC cable. (SIG-FUN)

18.3.2.4

Amend as follows:

18.3.2.4 Voltage drop calculations shall be performed using one of the following methods:

(1) The lump sum calculation method, which shall be calculated as follows:

(a) Calculate the voltage drop using one of these formulas:

i. $V_D = I * ((R * 2 * L)/1,000)$ **OR**

ii. $V_D = (2 * K * I * L)/CM$.

(b) Subtract this calculated voltage drop from 20.4 volts (V_S) in order to get the voltage value at the end of the circuit ($V_S - V_D = V_{EOL}$). The value for V_{EOL} shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

(2) The point-to point method, which requires a math-intensive approach where the voltage drop between each notification appliance is reiterated. This method is best done by utilizing a spreadsheet program. The calculated voltage at the last device on the circuit shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

Where:

V_D = Voltage Drop

V_S = Starting voltage (20.4vdc, or the end of useful battery life)

V_{EOL} = Voltage at the end-of-line resistor

I =Total load of the circuit in amperes utilizing current draws for each notification appliance @ 16vdc (the UL maximum draws at the minimum listed voltage).

R = Resistance in ohms per 1,000 feet, with respect to conductor

K = 10.64 ohms (the constant representing the mil-foot resistance of copper wire)

L = length of circuit in feet (distance from panel to end-of-line resistor for class B circuits)

CM = circular mill of wire, with respect to conductor.

V_{SOURCE} = voltage calculated at the previous device

Conductor Properties NEC Chapter 9 Table 8 (Uncoated Copper), see AHJ for other values

Wire	R (1-Strand / 7 Strand)	CM
No 18	7.77 / 7.95	1,620
No 16	4.89 / 4.99	2,580
No 14	3.07 / 3.14	4,110
No 12	1.93 / 1.98	6,530

18.4.2.3

Added exception. Amend as follows:

18.4.2.3 The standard evacuation signal shall be synchronized within a notification zone.

Exception: *Where a portion of a room or space is remodeled and new or existing audible devices are within the area of the remodel, such audible devices are required to synchronize with each other, but are not*

required to synchronize with existing audible devices within the notification zone if the existing audible devices are outside of the remodel area.

18.5.5.5.2

Added exception. Amend as follows:

18.5.5.5.2 Visible notification appliances shall be installed in accordance with Table 18.5.5.5.1(a) or Table 18.5.5.5.1(b) using one of the following:

(1) A single visible notification appliance
(2)* Two groups of visible notification appliances, where visual appliances of each group are synchronized, in the same room or adjacent space within the field of view. This shall include synchronization of strobes operated by separate systems
(3) More than two visible notification appliances or groups of synchronized appliances in the same room or adjacent space within the field of view that flash in synchronization

Exception: Where a portion of a room or space is remodeled and new or existing strobes are within the area of the remodel, such strobes are required to synchronize with each other, but are not required to synchronize with existing strobes in the field of view if the existing strobes are outside of the remodel area and were installed prior to the adoption of the 1996, or later, edition of NFPA 72.

18.5.5.5.9

New section

18.5.5.5.9 Ceiling-mounted visual appliances shall be provided in rooms and areas used for exhibition purposes, or in rooms and areas where racks or shelving that exceed 5 feet in height are expected to be installed, or in rooms and areas where wall-mounted devices may become obstructed.

18.5.5.7.2

New section

18.5.5.7.2 Documentation provided to the authority having jurisdiction shall be stamped by a licensed engineer or prepared by a NICET Level IV fire alarm designer and shall include the following:

(1) Inverse Square Law calculations using each of the vertical and horizontal polar distribution angles in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.

(2) The calculations shall account for the effects of polar distribution using one of the following:

   a. The percentages from the applicable table(s) in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.

   b. The actual results of laboratory tests of the specific appliance to be used as recorded by the listing organization.

23.2.2.4

New section

23.2.2.4 A permit is required prior to making any changes, except for room label changes.

23.8.5.9.3

New section

23.8.5.9.3. Where fire pumps are required to be monitored and a building fire alarm system is installed, the fire alarm system shall monitor all fire pump signals required at a constantly attended location in accordance with NFPA 20.

23.8.5.9.4

Added last sentence. Amend as follows:

23.8.5.9.4 Where fire pumps are required to be monitored and a sprinkler monitoring system is installed, then the sprinkler monitoring system shall monitor all fire pump signals required at a constantly attended location in accordance with NFPA 20. The sprinkler monitoring system shall monitor the signals required by NFPA 20 -19, 10.4.8 (Electric Pumps) and NFPA 20 – 19, 12.4.2.3. (Diesel Pumps).

23.8.6.3.2

Amend as follow:

23.8.6.3.2 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over into another notification zone. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

23.8.6.5

New section

23.8.6.5 Emergency Voice/Alarm Communication Notification Appliance Circuits. Emergency voice/alarm communication notification appliance circuits shall be capable of full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) as determined in accordance with Sections 23.8.6.5.1, 23.8.6.5.2 or 23.8.6.5.3.

23.8.6.5.1 Power Loss Calculations. A calculation for each circuit shall be provided to the authority having jurisdiction demonstrating simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB). Power loss calculations similar to the following shall be used:

PLoss = 10 * Log [1 - ((2 * RL) / (2 * RL + (VLine squared / PRated))]

RL = (RRef / 1000) * D

With variables defined as follows:

D = length of wire used (in feet)
PLoss = power loss (in dB)
PRated = power driven on line from the amplifier (in watts)
RL = wire gauge resistance (in ohms)

RRef = wire resistance based on gauge of wire used (in ohms/ft.)
VLine = voltage on line (typically 25 volts or 70 volts)

Alternatively the distance may be calculated using a calculation similar to:

D = (61 / RRef) * (VLine squared / PRated)

23.8.6.5.2 Power Loss Tables. To ensure circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB), wiring shall be limited to the distance allowed in Tables 23.8.6.5.2.a and 23.8.6.5.2.b.

Table 23.8.6.5.2.a, 25 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	12	19	31	49	79
150	16	26	41	66	105
100	25	39	62	99	158
75	33	52	83	132	210
60	41	65	104	165	263
50	49	78	124	198	315
40	61	97	155	247	394
30	82	130	207	329	525
25	98	156	248	395	630

Table 23.8.6.5.2.b, 70 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	98	156	248	395	630
150	131	208	331	527	840
100	196	312	497	790	1260
75	262	416	662	1053	1680
60	327	520	828	1317	2100
50	392	624	993	1580	2520
40	491	780	1242	1975	3150
30	654	1039	1656	2633	4200
25	785	1247	1987	3160	5041

*Cable Ohms is expressed in ohms per 1000 feet (2008 NEC Ch.9 Table 8, uncoated, single strand copper, see NEC or AHJ for other values)
The length represented accounts for both wires in the circuit.

23.8.6.5.3 Manufacturers Power Loss Calculator. When allowed by the authority having jurisdiction manufacturers calculations showing circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) are acceptable.

24.4.9.4

24.4.9.4 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over the notification zone boundary. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.