Southern Nevada Amendments to the 2024 International Fire Code

Including various NFPA Standards

SNFC / FPAN International Fire Code Committee

Version Dated: April 8, 2025

Preface

This document was developed by the Southern Nevada Fire Chiefs (SNFC) / Fire Prevention Association of Nevada (FPAN) Fire Code Committee and presents amendments to the 2024 International Fire Code and various NFPA Codes and Standards as published by the International Code Council and associated National Fire Protection Association (NFPA) Standards.

Participation in the 2024 SNFC/FPAN Fire Code Committee was open to all interested parties. However, voting on amendments proposals was limited to one vote each for seven of Southern Nevada municipalities (Clark County, Henderson, Las Vegas, North Las Vegas, Boulder City, Pahrump and Mesquite), the Clark County School District, and three industry representatives. All committee proceedings were conducted in accordance with Robert's Rules of Order.

The recommended amendments contained herein are not code unless adopted and codified by governmental jurisdictions. These amendments are not intended to prevent the use of any material or method of construction not specifically prescribed herein, provided any alternates have been approved and their use authorized by the Building Official. This document may be copied and used in whole or in part without permission or approval from the organizations listed on the cover page.

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Section 101.2.1

Revise Section 101.2.1 as follows:

[A] 101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The following appendices are hereby adopted and are 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 P – Proprietary (self) monitoring, as amended.

Appendix Q – Impairment procedures, as amended.

Section 102.7.3

Revise Section 102.7.3 as follows:

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 – 2024, *International Mechanical Code* is replaced with the 2024 *Uniform Mechanical Code*

IPC – 2024, *International Plumbing Code* is replaced with the 2024 *Uniform Plumbing Code*

Section 104.12

Add Section 104.12 as follows:

104.12 Fire protection reports. All *high-rise buildings*, *covered mall buildings*, and buildings with an *atrium*, 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 a *registered design professional* working in their area of expertise.

104.12.1 Building fire protection reports. Building fire protection reports shall describe the building uses, construction and life safety features of the entire building.

104.12.2 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 protection 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.*

104.12.3 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.

104.12.4 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.

104.12.5 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.*

Section 105.1.7

Revise Section 105.1.7 as follows:

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:

    3.1. To erect temporary membrane structures, tents, or canopies. See Chapter 31 $2,000,000.

    3.2. 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.

    3.3. 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*.

Section 105.5.5

Delete Section 105.5.5 Carnivals and fairs.

Section 105.5.9

Revise Section 105.5.9 as follows:

105.5.9 Compressed gases. An operational permit is required for the storage, use or handling at *normal temperature and pressure* (NTP) of *compressed gases* in excess of the amounts listed in Table 105.5.9.

Exception: Vehicles equipped for and using *compressed gas* as a fuel for propelling the vehicle.

TABLE 105.5.9 – PERMIT AMOUNTS FOR COMPRESSED GASES	
TYPE OF GAS	**AMOUNT (cubic feet at NTP)**
Carbon dioxide used in carbon dioxide enrichment systems	875 (100 lb)
Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications or Theatrical Fog Effects	875 (100 lb)
Corrosive	200
Flammable (except cryogenic fluids and liquified petroleum gases)	200
Highly Toxic	Any Amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount
Liquified carbon dioxide	875 (100 lb)
For SI: 1 cubic foot = 0.02832 m^3.	

Section 105.5.30

Revise Section 105.5.30 as follows:

105.5.30 LP-gas. An operational permit is required for:

1. Storage and use of LP-gas.

   Exceptions:

   1. A 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 water capacity or less or multiple containers having an aggregate quantity not exceeding 30 gallons water capacity.
3. Operation of cargo tankers that transport LP-gas.

Section 105.5.58

Add Section 105.5.58 as follows:

105.5.58 Fire Pumps. An operational permit is required for temporary and permanent fire pumps.

Section 105.5.59

Add Section 105.5.59 as follows:

105.5.59 Hood Suppression Systems. An operational permit is required for *automatic fire-extinguishing systems* protecting commercial cooking systems.

Sections 105.5.60 – 105.5.66

Add Sections 105.5.60 – 105.5.66 as follows:

105.5.60 Emergency responder communications enhancement systems. An operational permit is required to operate an Emergency Responder Communications Enhancement System regulated by Chapter 5.

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

105.5.62 Proprietary / self-monitoring. An operational permit is required to operate an onsite proprietary (self) monitoring fire alarm system. See Appendix P.

105.5.63 Smoke control and/or removal systems. An operational permit is required for facilities that have smoke control and/or removal systems.

105.5.64 Special activity. An operational permit is required at locations that operate Christmas trees, pumpkin patch lots, and similar locations. See Section 324.

105.5.65 Tire storage. An operational permit is required to store tires in excess of 1,000 cubic feet (28.3m³). See Chapter 34.

105.5.66 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.

Section 105.6.3

Revise Section 105.6.3 as follows:

[A] 105.6.3 Compressed gases. Where the *compressed gases* in use or storage including fog effect and beverage dispensing systems that utilize CO_2 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 working days of commencement of work.
3. Category 3 compressed air and/or piped vacuum systems as defined by NFPA 99.

Section 105.6.7

Revise Section 105.6.7 as follows:

[A] 105.6.7 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 to be a modification and does not require a construction permit.

Sections 105.6.26 – 105.6.30

Add Sections 105.6.26 – 105.6.30 as follows:

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

105.6.27 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 P.

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

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

105.6.30 Water tanks. A construction permit is required for the installation of or modification to a water tank used to supply a fire protection system. See Chapters 5, 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.

Section 110.3

Revise Section 110.3 as follows:

[A] 110.3 Recordkeeping. A record of periodic inspections, tests, servicing and other operations and maintenance shall be maintained on the premises or other *approved* location for not less than 3 years, or a different period of time where specified in this code or referenced standards. Records shall be made available for inspection by the *fire code official*, and a copy of the records shall be provided to the *fire code official* on request.

The *fire code official* is authorized to prescribe the form, format, and timing of such record keeping. This shall include all records listed below or as otherwise indicated by the *fire code official*.

- Annual Fire Alarm
- Semi-Annual Hood Suppression
- Kitchen Hood Cleaning (as directed)
- Annual Standpipe
- Annual Emergency Radio (ERCES)
- Annual Private Hydrants
- Quarterly Fire Sprinkler
- Annual Fire Pump
- Semi-Annual Clean Agent
- Semi-Annual Paint & Spray Booths
- Energy Storage Systems (ESS)
- 5-year Internal Pipe
- 5-year Standpipe

110.3.1 Required Reports. The *fire code official* is authorized to require that certain required records be filed with the *fire code official*. Official reports shall be submitted to the *fire code official* and maintained through an approved electronic or web-based system. Required reports shall include all scenarios where a system impairment or deficiency has been identified, or where required system service has been declined, or where there is or will be a discontinuance of a required service. Required reports shall be uploaded to the approved electronic platform within the following timeframes:

Impairments - the licensed service contractor shall notify the property owner and the authority having jurisdiction of the impairment not later than the next business day after verifying the condition.

Deficiencies - If documented deficiencies have not been corrected within 30 calendar days of notifying the building owner or designated responsible party, the licensed service contractor shall

report the deficiencies to the authority having jurisdiction within 2 business days after the 30 calendar day's notification to the building owner expires.

Cancellation/Discontinuance of Service - A licensed firm must give 30 calendar days' written notice to the owner and the occupant, and electronic notification through the approved platform to the authority having jurisdiction before it may discontinue service to the owner or the occupant, or both.

Chapter 2

Amend Section 202 by adding or revising the following definitions:

DECOMMISSIONING. Planned shutdown that may or may not include removal of a building, system, in whole or part, operation, or use.

[BE] MAIN EXIT. Exit required at main entrance of assembly building, room or space with occupant load exceeding 300, where essentially all non-employees enter in the same approximate location for entry to the assembly use, such as where payment/ticketing is required for entry, where seating is accompanied by host/staff, where entry access is monitored by staff, and where the predominance of public entry is through a main entrance by building design.

[BG] MID-RISE BUILDING. A building with an occupied floor or occupied roof located more than 55 feet above, but not more than 75 feet above, the lowest level of fire department vehicle access.

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.

Section 203.4.2

Revise Section 203.4.2 as follows:

[BG] 203.4.2 Group E, Day Care Facilities. This group includes buildings and structures or portions thereof occupied by more than six children older than 2½ years of age who receive educational, supervision or personal care services for fewer than 24 hours per day.

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

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

[BG] 203.4.2.3 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 day care shall be classified as a Group R-3 occupancy or shall comply with the *International Residential Code.*

Section 203.7.4

Revise Section 203.7.4 as follows:

[BG] 203.7.4 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 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

Sections 203.7.4.1 – 203.7.4.4

Revise Sections 203.7.4.1 – 203.7.4.4 as follows:

[BG] 203.7.4.1 Classification as Group E. A child day care facility that provides care for more than six but not 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 child care rooms have an exit door directly to the exterior, shall be classified as Group E.

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

[BG] 203.7.4.3 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] 203.7.4.4 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*.

Section 203.9.3

Revise Section 203.9.3 as follows:

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

Buildings that do not contain more than two *dwelling units*

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

Congregate living facilities (nontransient) with 16 or fewer occupants

Boarding houses (nontransient)

Convents

Dormitories

Emergency services living quarters

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses with five or fewer guestrooms

Hotels (nontransient) with five or fewer guestrooms.

Motels (nontransient) with five or fewer guestrooms.

Section 203.9.3.1

Revise Section 203.9.3.1 as follows:

[BG] 203.9.3.1 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 of this code or Section P2904 of the *International Residential Code*.

Section 307.2

Revise Section 307.2 as follows:

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 on which the fire is to be kindled.

Section 307.4.1

Revise Section 307.4.1 as follows:

307.4.1 Bonfires. Bonfires are prohibited.

Section 307.4.4

Revise Section 307.4.4 as follows:

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.

Section 307.6

Add Section 307.6 as follows:

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.

Section 308.1.6

Revise Section 308.1.6 as follows:

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

Exceptions:

1. LP-gas-fueled devices used for sweating pipe joints or removing paint in accordance with Chapter 61.
2. Cutting and welding operations in accordance with Chapter 35.
3. Torches or flame-producing devices in accordance with Section 308.4
4. Candles and open-flame decorative devices in accordance with Section 308.1.11.
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.

Section 308.1.11

Add Section 308.1.11 as follows:

308.1.11 Open-flame devices. Open-flame devices shall comply with the applicable requirements of Sections 308.1.11.1 through 308.1.11.5. Fire pits and theatrical flame effects are regulated in Sections 307 and 308.3.2 respectively.

Exception: In one- and two-family dwellings.

Section 308.1.11.1

Revise Section 308.1.11.1 as follows:

308.1.11.1 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: Fixed unvented gelled or liquid alcohol burning decorative appliances in accordance with Section 308.1.11.3.

Section 308.1.11.2

Revise Section 308.1.11.2 as follows:

308.1.11.2 Candles, Candle Assemblies, Oil Lamps and Tea Lights. Candles, candle assemblies, oil lamps and tea lights shall comply with all of the following restrictions:

1. Liquid- or solid-fueled lighting devices containing more than 8 ounces (237 ml) of fuel must self-extinguish and not leak fuel at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) if tipped over.
2. The device or holder shall be constructed to prevent the spillage of liquid fuel or wax at the rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when the device or holder is not in an upright position.
3. The device or holder shall be designed so that it will return to the upright position after being tilted to an angle of 45 degrees (0.79 rad) from vertical.

   Exception: Devices that self-extinguish if tipped over and do not spill fuel or wax at the rate of more than 0.25 teaspoon per minute (1.26 ml per minute) if tipped over.
4. The flame shall be fully enclosed except where openings on the side are not more than 0.375-inch (9.5 mm) diameter or where openings are on the top and the distance to the top is such that a piece of tissue paper placed on the top will not ignite in 10 seconds.
5. Holders shall be made of noncombustible materials and securely attached to the open-flame device.
6. Fuel canisters shall be safely sealed for storage.
7. Storage and handling of *combustible liquids* shall be in accordance with chapter 57.
8. Shades, where used, shall be made of noncombustible materials and securely attached to the open-flame device holder.
9. Candelabras with flame-lighted candles shall be securely fastened in place to prevent overturning, and shall be located away from occupants using the area and at least five feet away from possible contact with drapes, curtains or other combustibles.

Section 308.1.11.3

Add Section 308.1.11.3 as follows:

308.1.11.3 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.*

Section 308.1.11.4

Revise Section 308.1.11.4 as follows:

308.1.11.4 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.

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

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

Section 308.1.11.5

Add Section 308.1.11.5 as follows:

308.1.11.5 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.

Section 308.3.1

Delete Section 308.3.1.

Section 315.3.2.1

Add Section 315.3.2.1 as follows:

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 of 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 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.

Section 323

Add Section 323 as follows:

SECTION 323 – INDOOR TRADE SHOWS AND EXHIBITIONS

323.1 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 105.5.15.

323.2 Exhibit Booths. Booths shall comply with 323.2.1 through 323.2.5.

323.2.1 Automatic Sprinklers

323.2.1.1 Exhibit booths exceeding 1,500 square feet are not permitted in nonsprinklered buildings.

323.2.1.2 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, provided the aggregate area of unsprinklered booths within the room does not exceed 30% of the room size.

323.2.1.3 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, provided the aggregate area of unsprinklered booths within the room does not exceed 30% of the room size.

323.2.1.4 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.

323.2.1.5 Hydraulic calculations shall be provided to the Authority Having Jurisdiction when the sprinklers are required by Section 323.2.1. 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.

323.2.2 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.).

323.2.3 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).

323.2.4 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.

323.2.5 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:
    4.1. 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
    4.2. 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:
    8.1. ANSI/UL 1975, Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes
    8.2. NFPA 289 using the 20 kW ignition source
9. Alternate materials as approved by the fire code official.

323.3 Decorative Curtains, and Textiles

323.3.1 Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 323, 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.

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

323.3.3 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.

323.3.4 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.

323.3.5 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 323.3.1 through 323.3.3.

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

323.4 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 of the following criteria:
    3.1. 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).
    3.2. The fryer is to be separated from all other equipment by a distance not less than 24 in.
    3.3. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
    3.4. 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.

323.5 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.

Section 324

Add Section 324 as follows:

SECTION 324 – SPECIAL ACTIVITY LOTS

324.1 General. Special activity lots, including Christmas tree lots, pumpkin patches, hay ride lots, and all other similar events, shall comply with this section.

324.2 Permit required. An operational permit shall be obtained prior to commencing a special activity lot operation. See Chapter 1.

324.3 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.

324.4 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.

324.4.1 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.

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

324.4.3 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.

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

324.4.5 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.

324.4.6 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.

324.5 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.

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

324.6.1 Fire extinguisher. A minimum two 2½ gallon water-type fire extinguisher shall be provided at an approved location for protection against incipient fires.

324.6.2 Water supply. The special activity lot shall be located within 300 feet of a fire hydrant unless otherwise approved by the AHJ.

324.6.3 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.

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

324.6.5 Open flame. Open flame or other devices emitting flame, fire, or heat or any flammable or combustible liquids, gas, charcoal, or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet of the special activity lot, unless approved by the fire code official.

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

Section 503.2.1

Revise Section 503.2.1 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).

Section 503.2.3

Revise Section 503.2.3 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 (15 000 kg) 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.

Section 503.2.4

Revise Section 503.2.4 as follows:

503.2.4 Turning Radius. The required turning radius of a fire apparatus access road shall be no less than 28 feet (8534 mm) inside turning radius and 52 feet (15 850 mm) outside turning radius.

Section 503.2.7

Revise Section 503.2.7 as follows:

503.2.7 Grade. The grade of the fire apparatus access road shall not exceed 12 percent (0.12 rad.). The maximum cross-slope curve shall not exceed two (2) percent (0.02 rad). Unless otherwise approved by the fire code official.

Section 503.2.8

Revise Section 503.2.8 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 (0.06 rad.) for 25 feet (7620 mm) before or after the grade change.

Section 503.2.9

Add Section 503.2.9 as follows:

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.

Section 503.2.10

Add Section 503.2.10 as follows:

503.2.10 Aerial Fire 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.

> **Exception:** Where *approved* by the *fire code official*, buildings of Type IA, Type IB or Type IIA construction equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and having fire fighter access through an enclosed *stairway* with a Class I standpipe from the lowest level of fire department vehicle access to all roof surfaces.

503.2.10.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of the building or portion thereof.

503.2.10.3 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*.

503.2.10.4 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*.

Sections 503.3 & 503.3.1

Revise Sections 503.3 and 503.3.1 as follows:

503.3 Marking. Fire apparatus access roads shall be marked where required to prohibit parking and other obstructions. Fire lane marking shall be consistent with one of the following packages.

Type A Package: Marking shall consist of painting the curb, or street surface, where no curb is present, with a suitable coat of industrial red enamel along the entire fire apparatus access lane where parking or obstructions are prohibited. All curb that is painted red shall also be marked by signage stating “NO PARKING FIRE LANE”(Type A package). Signs are to be installed no higher than 10 feet or less than 6 feet from the surface of the roadway. 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.

Type B Package: Minimum of one sign is provided at every entrance stating “ON-STREET PARKING IN MARKED FIRE LANES PROHIBITED” (Type B package), fire lanes shall be marked by painting the words “NO PARKING FIRE LANE” (Curb/surface marking), over the face of the red-painted curbs or street surface where no curbs are present. 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.

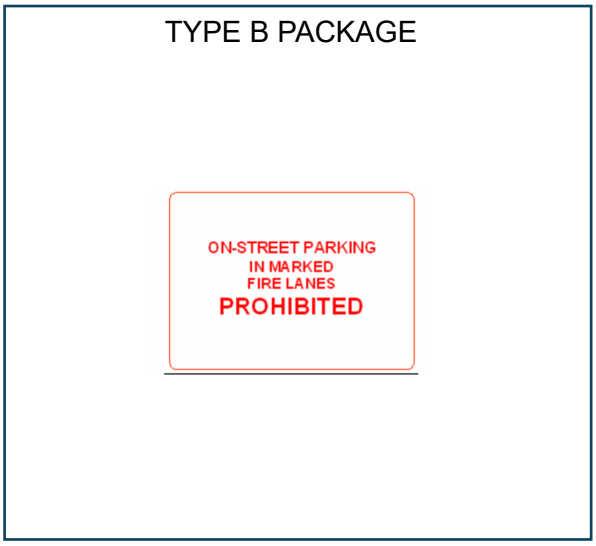
503.3.1 Sign Specifications. Where required by the fire code official signs shall be in accordance with one of the following packages:

Type A Package: Minimum dimension of 18 inches (457mm) high by 12 inches (305 mm) wide. Red letters on a reflective white background with 3/8 inch (9.525mm) red trim around entire outer edge of sign. Lettering shall be: “FIRE LANE”. see following Exhibit.

Type B Package: Minimum dimension of 18 inches (457 mm) high by 24 inches (610 mm) wide. Red letters on reflective white background with 3/8 inch (9.525mm) red trim strip around the entire outer edge of sign. Lettering on sign shall be: “ON STREET PARKING IN MARKED FIRE LANES PROHIBITED” Curb/Surface Markings: 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”. see following Exhibit.

Signs shall be installed not less than 6 feet (1830 mm) and not more than 10 feet (3048 mm) from the ground level. Posts for signs shall be metal and securely mounted, unless written permission for alternatives is obtained prior to installation from the fire code official.

TYPE A PACKAGE



CURB/SURFACE MARKING

Section 503.4.1

Revise Section 503.4.1 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.

Section 503.6

Amend Section 503.6 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. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed, and installed to comply with the requirements of ASTM F2200.

503.6.1 Permit. A construction permit is required to install a gate that obstructs a fire apparatus access road in accordance with Section 105.6.12. 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 the following in accordance with the rules and regulations specified by the Fire Department:

1. An approved vehicle detector/receiver system.
2. An approved key switch override configured as a two-position toggle switch when required by the *fire code official*.

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. The following information shall be included in the submittal:

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.
6. Approved civil plans showing gate and hydrant location(s).

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.

Section 505.1

Revise Section 505.1 as follows:

505.1 Address identification. New and existing buildings shall be provided with *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Where required by the *fire code official*, address identification shall be provided in additional *approved* locations to facilitate emergency response. Address identification shall be in compliance 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.

Section 505.3

Add Section 505.3 as follows:

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.

Section 507.1

Revise Section 507.1 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 on 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.

Section 507.5

Revise Section 507.5 as follows:

507.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.7.

Section 507.5.7

Add Section 507.5.7 as follows:

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. Onsite private fire hydrants shall be painted with a suitable prime coat and not less than two (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 the parking is not anticipated, nearest to the hydrant.

Section 508.1

Revise Section 508.1 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.

Section 508.1.6

Revise Section 508.1.6 as follows:

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

1. The emergency voice/alarm communications system control unit.
2. The fire department communications system.
3. Fire detection and alarm system graphic annunciator or a method approved by the *fire code official*.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The firefighter’s control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *interior exit stairway* doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.

9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, firefighter air-replenishment systems, firefighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. An *approved* Building Information Card that includes, but is not limited to, all of the following information:
    13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and the estimated building population during the day, night and weekend.
    13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer and their respective work phone number, cell phone number and email address.
    13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns and roof assembly.
    13.4. *Exit access stairway* and *exit stairway* information that includes: number of *exit access stairways* and *exit stairways* in building; each *exit access stairway* and *exit stairway* designation and floors served; location where each *exit access stairway* and *exit stairway* discharges, *interior exit stairways* that are pressurized; *exit stairways* provided with emergency lighting; each *exit stairway* that allows reentry; *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks.
    13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service.
    13.6. *Fire protection system* information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of *automatic sprinkler systems* installed including but not limited to dry, wet and pre-action.
    13.7. Hazardous material information that includes: location and quantity of hazardous material.
14. A means for viewing full size plans shall be provided in accordance with one of the following:
    14.1 A new worktable with a minimum size of three 3 feet (914 mm) by seven 7 feet (2134 mm) capable of holding plans in an open position.
    14.2 A method *approved* by the *fire code official*.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.

17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.
18. Elevator emergency or standby power selector switch(es) in accordance with ASME A17.1/CSA B44.
19. An approved whiteboard with a minimum size of three 3 feet (914 mm) by four 4 feet (1219 mm) capable of easy erasure with a marking device and an eraser attached.
20. Separate shunt trip switches for normal and emergency power.
21. A means for viewing and recording all fire alarm, supervisory, and trouble signals shall be provided in accordance with one of the following, and shall be connected to a UPS battery system and/or an emergency power supply:

    21.1 A printer connected to the fire alarm control panel.

    21.2 A method *approved* by the *fire code official*.
22. Emergency power and lighting.

Section 508.2

Add Section 508.2 as follows:

508.2 Secondary Response Point. A Secondary Response Point (SRP) shall be provided in accordance 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 (60 960 mm) 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 (76 200 mm), as measured along the building perimeter.

Section 510

Revise portions of Section 510 as follows:

SECTION 510 Emergency Responder Communications Enhancement Systems. In-building emergency responder communications enhancement systems (ERCES) shall be in accordance with this section and the Fire Prevention Association of Nevada guide for Emergency Responder Communications Enhancement Systems Permitting, Testing, & Recertification.

510.1 Emergency responder communications enhancement systems in new buildings. *Approved* in-building emergency responder communications enhancement system (ERCES) for emergency responders shall be provided in all new buildings. In-building ERCES within the building shall be based on the existing coverage levels of the public safety communications systems utilized by the jurisdiction, measured at the exterior of the building. The ERCES, where required, shall be of a type determined by the *fire code official* and the *frequency license holder(s)*. This section shall not require improvement of the existing public safety communications systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communications system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an *approved* communications coverage system.
2. Where it is determined by the *fire code official* that the communications coverage system is not needed.
3. In facilities where emergency responder communications coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder communications coverage system.
4. One-story buildings not exceeding 12,000 square feet (1115 m^2) with no below-ground area(s). Unless determined by the fire code official that a communications coverage system is required.

510.2 Emergency responder communications enhancement system in existing buildings. Existing buildings other than Group R-3 that do not have approved in-building emergency response communications enhancement 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 1.
2. Within a time frame established by the adopting authority.

Exception: Where it is determined by the *fire code official* that the in-building emergency responder communications enhancement system is not needed.

510.3.2 Operational permit. An operational permit is required as specified in Section 105.5.60 for the operation of an in-building emergency responder communications enhancement system.

510.4.1.1 Minimum signal strength into the building. The minimum *downlink* signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The *downlink* signal level shall be a minimum of -95dBm throughout the coverage area and sufficient to provide not less than a Delivered Audio Quality (DAQ) of 3.0 throughout the coverage area using either narrowband analog, digital or wideband LTE signals or an equivalent bit error rate (BER), or signal-to-interference-plus-noise ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.2.2 Technical criteria. The *fire code official* shall maintain a document providing the specific technical information and requirements for the in-building emergency responder communications enhancement system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design. This information shall be located in the Fire Prevention Association of Nevada guide for Emergency Responder Communications Enhancement Systems Permitting, Testing, & Recertification.

510.4.2.3 Standby power. In-building emergency responder communications enhancement 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 in-building emergency responder communications enhancement system at 100-percent system capacity for a duration of not less than 12 hours.

510.4.2.10 Pathway Survivability. The system shall be designed with a designated pathway survivability as described in NFPA 1225 Section 18.12.3.3 and 18.12.3.4.

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.

510.4.2.11 Cable.

510.4.2.11.1 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.

510.4.2.11.2 Cable shall have a passband of 700-900 MHz

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

1. A valid FCC-issued general radio operator’s license.
2. Certification of in-building system training issued by an *approved* organization or *approved* school, or a certificate issued by the manufacturer of the equipment being installed.

510.5.3.1 Minimum qualifications of the designer. Effective two years from the date of fire code adoption, the minimum qualifications of the system designer shall include the following:

1. Certification by National Institute for Certification in Engineering Technologies (NICET) as a Design Technician in In-Building Public Safety Communications (IB-PSC).

510.5.4 Acceptance test procedure. Where an in-building emergency responder communications enhancement system is required, and upon completion of installation, the

building *owner* shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows and as detailed in the Fire Prevention Association of Nevada guide for Emergency Responder Communications Enhancement Systems Permitting, Testing, & Recertification.

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the *agency* talking through the *agency's* radio communications system or equipment *approved* by the *fire code official*.
3. Failure of more than one test area shall result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public *agency's* radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.
8. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

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

1. In-building coverage test as described in Section 510.5.4.
2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

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

At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.4, shall be submitted to the *fire code official* as described in Section 110.3.

Section 604.2

Revise Section 604.2 as follows:

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

Section 605.1.3

Revise Section 605.1.3 as follows:

605.1.3 Fuel Oil. The grade of fuel oil used in an oil burner shall be that for which the oil 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 where 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.

Section 605.4.2.3

Revise Section 605.4.2.3 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 equipment, generators or fire pumps installed in accordance with Section 605.4.2.5. Connections between tanks and equipment supplied by such tanks shall be made using closed piping systems in accordance with the *Uniform Mechanical Code*. Fuel connections and tank relief vents shall be located on the exterior of the building in approved locations.

Section 606.3.5

Add Section 606.3.5 as follows:

606.3.5 Access Panel Coordination. Ducts shall be provided with access panels to facilitate servicing of automatic sprinklers installed within the duct. Access panel locations shall be coordinated with the location of automatic sprinklers and located a maximum of 18 inches (457 mm) away from the installed sprinkler location. Access panels shall be in accordance with the *Uniform Mechanical Code* requirements.

Section 608.6

Revise Section 608.6 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 1102.3 of the *Uniform Mechanical Code* shall be provided for the fire department at all times as required by the *fire code official*.

Section 608.7

Revise Section 608.7 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 1102.3 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.

Section 608.8

Revise Section 608.8 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 1102.3 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 *Uniform Mechanical Code* for the classification of refrigerants listed therein.

Section 608.10

Revise Section 608.10 as follows:

608.10 Remote controls. Where flammable refrigerants are used and compliance with Section 1107.0 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.

Section 608.12

Revise Section 608.12 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 1102.3 of the *Uniform Mechanical Code*. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

Exception: This provision shall not apply to spare parts, tools and incidental materials necessary for the safe and proper operation and maintenance of the system.

Section 608.17

Revise Section 608.17 as follows:

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

Exception: Ammonia machinery rooms that are provided with ventilation in accordance with Section 1102.2 of the *Uniform Mechanical Code*.

Section 803.10.1

Add Section 803.10.1 as follows:

[BF] 803.10 Site-fabricated stretch systems. Where used as newly installed interior wall or interior ceiling finish materials, *site-fabricated stretch systems* containing all three components described in the definition in Chapter 2 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or with the requirements of Class A in accordance with Section 803.1.2. If the materials are tested in accordance with ASTM E84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E2573.

803.10.1 Ceilings. Where used as a dropped ceiling, the following shall apply:

1. In Types I and II construction, frames shall be of non-combustible materials.
2. Where automatic sprinkler protection in accordance with Section 903.3.1.1 or 903.3.1.2 is required beneath the panel, core materials shall be of non-combustible materials.

Section 806.1.1

Revise Section 806.1.1 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.

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

Section 807.1

Revise Section 807.1 as follows:

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

1. Furnishings or decorative materials of an explosive or highly flammable character shall not be used.
2. Fire-retardant coatings in existing buildings shall be maintained so as to retain the effectiveness of the treatment under service conditions encountered in actual use.
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. The permissible amount of noncombustible decorative materials shall not be limited.

Section 901.2.2

Add Section 901.2.2 as follows:

901.2.2 Plans. Complete plans and specifications 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 (contractor's 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.

Section 901.4.7

Revise Section 901.4.7 as follows:

901.4.7 Pump and riser rooms. Where provided, fire pump rooms and *automatic sprinkler system* riser 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 and *automatic sprinkler system* riser rooms shall be provided with exterior access doors and unobstructed passageways large enough to allow removal of the largest piece of equipment with a minimum width of 36 inches (914 mm) and a minimum height of 80 inches (2032 mm).

1. *Automatic sprinkler system* riser rooms shall have a minimum area of 16 square feet (1.49 m^2), with a minimum dimension of 4 feet (1219 mm) for the first sprinkler riser plus an additional 9 square feet (0.84 m^2) for each additional riser contained, unless otherwise approved by the fire code official.

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.

901.4.7.1 Access. Automatic sprinkler system risers, fire pumps and controllers shall be provided with *ready access*. Where located in a fire pump room or *automatic sprinkler system* riser 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 *automatic sprinkler system* riser rooms and fire pump rooms shall be labeled with an *approved* weatherproof sign. Signage shall state: “Fire Sprinkler Riser Room” and “Fire Pump Room” or “Fire Pump House”. 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 Environment. *Automatic sprinkler system* riser rooms and fire pump rooms shall be maintained at a temperature of not less than 40°F (4°C) and a maximum temperature of 100º F (37.8°C). 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 below 40º F (4°C) or rise above 100º F (37.8°C). To maintain 40º F (4°C), the temperature analysis must use a starting temperature of 50º F (10°C) and use an outside temperature of 0º F (-17.8°C) for a period of 8 hours. To maintain 100º F (37.8°C), the temperature analysis must use a starting temperature of 90º F (32.2°C) and use an outside temperature of 120º F (48.9°C) 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.

901.4.7.4 Lighting. Permanently installed artificial illumination shall be provided in the *automatic sprinkler system* riser rooms and fire pump rooms. Lighting shall be provided with emergency power. Emergency power shall be capable of maintaining lighting level for a minimum of 2 hours.

901.4.7.5 Protection. Fire pump rooms and *automatic sprinkler system* riser rooms shall be separated from the rest of the building by 1-hour fire partitions.

901.4.7.6 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 comply with section 901.4.7.3.
6. Fire pump rooms complying with Section 901.4.7.
7. When approved, rooms containing auxiliary control valves.

901.4.7.6.1 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, main drain, & pressure gauges.

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.

Section 901.6

Revise Section 901.6 as follows:

901.6 Inspection, testing and maintenance. *Fire protection* and *life safety systems* shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection* and *life safety systems* and equipment shall be inspected, tested and maintained or removed in accordance with Section 901.8.

All fire life safety systems shall be tested and inspected in accordance with nationally recognized standards and the State of Nevada Fire Marshals' Regulations. The maintaining 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 protection company is required.

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.

Section 901.10

Revise Section 901.10 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.

Section 903.1.1

Delete Section 903.1.1.

Section 903.2

Revise Section 903.2 as follows:

903.2 Where required. *Approved automatic sprinkler systems* 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 is 5,000 square feet (464 m^2) or greater.
2. For buildings constructed in accordance with the *International Residential Code*, approved automatic sprinkler systems 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 systems shall be provided as required by the fire code official.
4. For any buildings, not otherwise requiring fire sprinklers, where they do not meet the fire access requirements in Section 503 approved automatic sprinkler systems shall be provided as required by the fire code official.

   Exceptions:

   1. 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).

2. Playground shade structures, fuel dispensing canopies, and carports open to a minimum clear height of 10 feet (3048 mm) 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 (3048 mm) from the nearest building, property line or shade structure, and less than 10,000 square feet (929 m^2) in projected area, do not require fire sprinklers.
3. 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 (464 m^2) square feet.
4. Unless otherwise required per Section 903.2.10, open parking garages, in accordance with Section 406.5 of the International Building Code 48,000 (4460 m^2) square feet or less 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.
5. 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 having fire areas not exceeding the fire area thresholds listed in the published, unamended, *International Building Code* or *International Fire Code* adopted by the jurisdiction. This exception does not apply to non-exempted buildings or structures containing occupiable spaces such as offices, meeting rooms, service counters, public restrooms, laboratories, warehouses or other normally occupied spaces.

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 section 706 of 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.

Section 903.2.3

Revise Section 903.2.3 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 (464 m^2) 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.

Section 903.2.9

Revise Section 903.2.9 as follows:

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

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 *fire area* used for the storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m^2).
5. A Group S-1 *fire area* used for the storage of lithium-ion or lithium metal powered vehicles where the *fire area* exceeds 500 square feet (46.4 m^2).
6. Group S-1 *fire area* used for self-storage where the *fire area* is 2,500 square feet (232 m^2) or greater.

Section 903.2.11.5

Revise Section 903.2.11.5 as follows:

903.2.11.5 Commercial cooking operations. An *automatic sprinkler system* shall be installed in a commercial kitchen exhaust hood and duct systems 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 (22 860 mm).

Section 903.3.1.1.1

Revise Section 903.3.1.1.1 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 a room merely because it is damp, of *fire-resistance-rated* construction or contains electrical equipment.

1. A room or space where sprinklers constitute a serious life or fire hazard because of the nature of the contents, where *approved* by the *fire code official*.
2. Fire service access elevator machine rooms and machinery spaces.
3. 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*.

Section 903.3.1.2

Revise Section 903.3.1.2 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 less above *grade plane*.
2. For other than Group R-2 occupancies, the floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access.

   For Group R-2 occupancies, the roof assembly is less than 45 feet (13 716 mm) above the lowest level of fire department vehicle access. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance.
3. The floor level of the lowest story is 30 feet (9144 mm) or less below the lowest level of fire department vehicle access.

The number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from *grade plane*.

Section 903.3.5.3

Add Section 903.3.5.3 as follows:

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.

Section 903.3.9

Revise Section 903.3.9 as follows:

903.3.9 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 buildings.

Section 903.3.10

Revise Section 903.3.10 as follows:

903.3.10 Tenant isolation control valves. *Approved* supervised indicating control valves shall be provided for Group A and Group 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.

Sections 903.4 – 903.4.3

Revise Sections 903.4 – 903.4.3 as follows:

903.4 Sprinkler system supervision and alarms. *Automatic sprinkler system* supervision and alarms shall comply with Sections 903.4.1 through 903.4.3. Unless otherwise approved, systems meeting the requirements of this section shall not be used for any other purpose.

903.4.1 Electronic supervision. Valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and waterflow switches on all *automatic sprinkler systems* shall be electrically supervised in accordance with NFPA 72 by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Limited area sprinkler systems in accordance with Section 903.3.8, provided that the backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position unless supplying an occupancy required to be equipped with a *fire alarm system*, in which case the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to 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.
9. Backflow prevention devices located at the municipal water supply connection are not required to be electrically supervised when either locked in the open position, located within an underground vault, or located within an approved insulated enclosure.

903.4.2 Monitoring. Systems providing electronic supervision required by Section 903.4.1 shall be monitored by an approved supervising station in accordance with NFPA 72 and as *approved* by the *fire code official*.

Exception: Monitoring by a supervising station is not permitted unless specifically *approved* by the *fire code official* for:

1. *Automatic sprinkler systems* protecting one- and two-family *dwellings*.
2. Monitoring systems utilizing point-by-point monitoring.

In occupancies provided with a supervised sprinkler system, the following three distinctly different signals shall be transmitted to an *approved* supervising station:

1. Waterflow Alarm
2. Supervisory
3. System Trouble

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

903.4.2.1 Transmission of signals. Transmission of signals to a supervising station shall be in accordance with NFPA 72.

903.4.2.2 MIY monitoring. Direct transmission of signals associated with monitor it yourself (MIY) transmitters to a public safety answering point (PSAP) shall not be permitted unless *approved* by the *fire code official*.

903.4.2.3 Termination of monitoring service. Prior to termination of monitoring service, notice shall be provided in accordance with Section 110.3.

903.4.3 Alarms. *Approved* audible and visual sprinkler waterflow alarm devices, shall be connected to each *automatic sprinkler system*. Exterior sprinkler waterflow alarm devices shall be provided on the exterior of the building above the wall-mounted Fire Department Connection. One interior sprinkler waterflow alarm device shall be provided near the main entrance or in a normally occupied location. In multiple-tenant facilities, one interior sprinkler waterflow alarm device shall be provided near the main entrance or in a normally occupied location for each tenant space. Such sprinkler waterflow alarm devices shall be activated by waterflow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where exterior sprinkler waterflow alarm devices are provided above wall-mounted Fire Department Connections, the exterior device shall activate only upon waterflow from systems hydraulically connected to the associated Fire Department Connection. Where a *fire alarm system* is provided, exterior sprinkler waterflow alarm devices shall be powered by a fire alarm control unit and actuation of the *automatic sprinkler system* shall actuate the building *fire alarm system*.

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

Section 903.6

Revise Section 903.6 as follows:

903.6 Where required in existing buildings and structures. An *automatic sprinkler system* shall be provided in existing buildings and structures 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 Addition with sprinklers. 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 remainder 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.

903.6.1.2 Addition without sprinklers. 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) (existing building area plus the addition) 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.
3. 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 (464 m^2).

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

903.6.2.1 Alterations with sprinklers added. 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 remainder 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 Alterations without sprinklers. 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 Change of Occupancy with sprinklers added. 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 remainder of the building by a fire barrier constructed in accordance with Section 707 of the International Building Code, and without openings.
2. 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.
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.
4. 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 Change of Occupancy without sprinklers. In existing buildings without sprinklers, sprinklers are not required to be provided where the change of occupancy meets the provisions of the *International Existing Building Code* and the provisions of Section 903 of the *International Building Code.* If sprinklers are not required, the remainder of the building is not required to be provided with sprinklers where in accordance with Section 903.6.3.1.

Section 904.2

Revise Section 904.2 as follows:

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

Section 904.14.5.2

Revise Section 904.14.5.2 as follows:

904.14.5.2 Extinguishing system service. *Automatic fire-extinguishing systems* shall be serviced not less frequently than every six 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 maintained in accordance with Section 110.3.

Section 905.3

Revise Section 905.3 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 systems*.

Exceptions:

1. Standpipe systems are not required in Group R-2 *townhouses*.
2. 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.

Section 905.3.1

Revise Section 905.3.1 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.

   Exception: 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.

Section 905.3.3

Revise Section 905.3.3 as follows:

905.3.3 Covered and open mall buildings. Covered mall and open mall buildings shall be equipped throughout with a standpipe system where required by Section 905.3.1. Mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the *automatic sprinkler system* sized to deliver water at 250 gallons per minute (946.4 L/min) at the hydraulically most 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.

Section 905.3.8

Add Section 905.3.8 as follows:

905.3.8 Building area. When required by the fire code official, buildings in excess of 10,000 square feet (929 m²) 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.

Section 905.4

Revise Section 905.4 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* or *exterior exit stairway*, a hose connection shall be provided for each story above and below *grade plane*. Hose connections shall be located at the main floor landing unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open *corridor* or open breezeway between open *stairs* that are not greater than 75 feet (22 860 mm) apart.

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

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

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

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

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

5. Where the roof has a slope less than 4 units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.

6. 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.

Section 905.4.1

Revise Section 905.4.1 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 *International 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.

Sections 905.9 – 905.9.1.1

Revise Sections 905.9 – 905.9.1.1 as follows:

905.9 Valve Supervision. Valves controlling water supplies shall be electrically supervised in the open position in accordance with Sections 903.4.1 & 903.4.2. Where a *fire alarm system* is provided, a signal shall be transmitted to the control unit.

Exception: Valves to underground key or hub valves in roadway boxes do not require supervision.

905.9.1 In buildings not provided with an *automatic sprinkler system* or a *fire alarm system*, valves controlling water supplies shall be electrically supervised in accordance with Section 905.9 where an *automatic sprinkler system* or a *fire alarm system* is provided in an adjacent building on the same *lot*.

905.9.1.1 Where Sections 905.9 and 905.9.1 do not require electronic supervision of valves, valves shall be locked in the normal position and inspected as provided in this code.

Section 906.2

Revise Section 906.2 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 distance of travel to reach an extinguisher shall not apply to the 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 every 3 years when extinguisher maintenance is performed.
   2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the *owner* to verify that hydrostatic tests are conducted at the frequency required by NFPA 10.
3. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

Section 907.1

Revise Section 907.1 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.

Section 907.1.4

Add Section 907.1.4 as follows:

907.1.4 Signage. A “FIRE ALARM CONTROL PANEL”, “FACP”, or “FIRE ALARM CONTROL UNIT”, “FACU” sign shall be provided in minimum 2 inch (51 mm) letters with a minimum ½ inch (13 mm) 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*.

Section 907.2

Revise Section 907.2 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 907.2.24 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 IRC.

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 due to sprinklers, a single fire alarm box shall be installed.

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

Section 907.2.7.1.1

Delete Section 907.2.7.1.1.

Section 907.2.8.2

Revise Section 907.2.8.2 as follows:

907.2.8.2 Automatic smoke detection system. An *automatic smoke detection system* that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior *corridors* serving *sleeping units*. 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 *sleeping units* and where each *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

Section 907.2.9.1

Revise Section 907.2.9.1 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*.
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 not less than 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 of egress* door opening directly to an exterior *exit access* that leads directly to the *exits* or are served by open-ended *corridors* designed in accordance with Section 1027.6, Exception 3.

      3.1. This exception shall not apply to buildings 3 or more stories in height.

Section 907.2.9.1.1

Revise Section 907.2.9.1.1 as follows:

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*.

Section 907.2.10.1

Revise Section 907.2.10.1 as follows:

907.2.10.1 Public- and self-storage occupancies. A manual *fire alarm system* that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group S public- and self-storage occupancies three stories or greater in height.

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

Section 907.2.13

Revise Section 907.2.13 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 of this code 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*.

Section 907.2.13.1.3

Add Section 907.2.13.1.3 as follows:

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.

Section 907.2.13.2

Revise Section 907.2.13.2 as follows:

907.2.13.2 Fire department communication system. Where a wired communication system is provided in addition to an in-building, two-way emergency responder communication 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*.

Section 907.2.13.3

Revise Section 907.2.13.3 as follows:

907.2.13.3 Multiple-channel voice evacuation. Voice evacuation systems for high-rise buildings shall be multiple-channel systems.

Section 907.2.13.4

Add Section 907.2.13.4 as follows:

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.

Section 907.2.16

Delete Section 907.2.16.

Section 907.2.24

Add Section 907.2.24 as follows:

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

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

Section 907.3.1

Revise Section 907.3.1 as follows:

907.3.1 Duct smoke detectors. Smoke detectors installed in ducts shall be *listed* for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit where a *fire alarm system* is provided. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal on the building's fire alarm control unit when a *fire alarm system* is provided and shall perform the intended fire safety function in accordance with this code and the *Unform Mechanical Code*. In facilities that are required to be monitored by a supervising station, duct smoke detectors shall report only as a supervisory signal and not as a fire alarm. They shall not be used as a substitute for required open area detection.

Section 907.4.1

Revise Section 907.4.1 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 a smoke detector, a heat detector shall be permitted.
2. Dedicated function sprinkler monitoring systems shall not be required to have a smoke detector installed above the dedicated function control unit.

Section 907.4.2

Revise Section 907.4.2 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.

Section 907.5.2.1.1

Revise Section 907.5.2.1.1 as follows:

907.5.2.1.1 Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of not less than 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. Sound pressure levels shall be measured during system acceptance testing to verify the space achieves a minimum of 80 dBA.
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 dBA 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.

Section 907.5.2.2.6

Add Section 907.5.2.2.6 as follows:

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 – INTELLIGIBILITY RELATIONSHIPS		
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.

Section 907.5.2.3.1

Revise Section 907.5.2.3.1 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. Storage rooms, electrical rooms and mechanical rooms that are not normally occupied and are less than 400 square feet.
2. Janitor closets.
3. Exit enclosures.
4. Individual work areas or offices and private toilets serving individual work areas or offices provided that the notification appliance circuits serving such areas are initially designed with not less than 20-percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing-impaired employee(s).
5. Individual inmate sleeping areas and patient sleeping rooms.

Section 907.5.2.3.2

Revise Section 907.5.2.3.2 as follows:

907.5.2.3.2 Groups I-1 and R-1. *Dwelling units* and *sleeping units* in Group I-1 and R-1 occupancies in accordance with Table 907.5.2.3.2 shall be provided with visible alarm notification throughout the unit except in closets that are not walk-in closets. Visible alarms shall be activated by the in-room smoke alarm and the building *fire alarm system*.

Section 907.5.2.3.3.1

Revise Section 907.5.2.3.3.1 as follows:

907.5.2.3.3.1 Wired equipment. Where wired equipment is used to comply with the future capability required by Section 907.5.2.3.3, one of the following shall be provided:

1. All notification and auxiliary circuits serving dwelling or sleeping units shall be provided with a return loop to the power supply serving those units utilizing the same size conductors.

2. Proof calculations for load and voltage drop shall be provided to the Authority Having Jurisdiction for all power supplies and notification/auxiliary circuits serving dwelling or sleeping units. Proof calculations shall demonstrate sufficient spare capacity for conversion of the most demanding unit on each circuit to include visible notification.

Section 907.6.4.1

Revise Section 907.6.4.1 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.

Section 907.6.6

Revise Section 907.6.6 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 907.2.11.
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 five 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.
5. Carbon Monoxide Alarm, 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 carbon monoxide and 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, etc.).

Section 907.6.7

Add new Section 907.6.7 as follows:

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*.

Section 907.6.8

Add new Section 907.6.8 as follows:

907.6.8 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.

Section 907.9

Revise Section 907.9 as follows:

907.9 Where required in existing buildings and structures. An *approved fire alarm system* shall be provided in existing buildings and structures where required in this section.

907.9.1 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 remainder 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.

907.9.2 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.

907.9.3 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 and fire code 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 code 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: In 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.

Section 909.5.3

Revise Section 909.5.3 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. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors *listed* for releasing service installed in accordance with Section 907.3.
2. Fixed openings between smoke zones that are protected utilizing the airflow method.

3. In Group I-1, Condition 2; Group I-2; and *ambulatory care facilities*, where a pair of opposite-swinging doors are installed across a *corridor* in accordance with Section 909.5.3.1, the doors shall not be required to be protected in accordance with Section 716 of the *International Building Code*. The doors shall be close-fitting within operational tolerances and shall not have a center mullion or undercuts in excess of ¾ inch (19.1 mm), louvers or grilles. The doors shall have head and jamb stops and astragals or rabbets at meeting edges and, where permitted by the door manufacturer's listing, positive-latching devices are not required.
4. In Group I-2 and *ambulatory care facilities*, where such doors are special-purpose horizontal sliding, accordion or folding door assemblies installed in accordance with Section 1010.3.3 and are automatic closing by smoke detection in accordance with Section 716.2.6.6 of the *International Building Code*.
5. Group I-3.
6. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.
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.

Section 909

Amend Sections 909.2, 909.16, 909.16.1-3, 909.18, 909.18.10, 909.20.4.1, 909.22, 909.22.4-5, Section 909.23 as follows:

909.2 General design requirements. Buildings, structures, or parts thereof required by the *International Building Code* or this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909, the Fire Prevention Association of Nevada (FPAN) Uniform Guideline for Smoke Control Testing & Recertification, and the generally accepted and well-established principles of engineering relevant to the design. The *construction documents* shall include sufficient information and detail to describe adequately the elements of the design necessary for the proper implementation of the smoke control systems, these documents shall be accompanied with sufficient information and analysis to determine compliance with these provisions.

909.16 Firefighter's smoke control panel. An approved firefighter'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 firefighter's smoke control panel shall be installed in an *approved* location adjacent to the fire alarm control panel. The firefighter's

smoke control panel shall comply with Sections 909.16.1 through 909.16.3. When approved by the code official an alternate means of display may be used.

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

1. Fans, dampers and other operating equipment in their normal status GREEN.
2. Fans, dampers and other operating equipment in their off or smoke mode status—RED.
3. Fans, dampers and other operating equipment in their on or ancillary smoke mode status – BLUE.
4. Fans, dampers and other operating equipment in a fault status—YELLOW/AMBER.

909.16.2 Smoke control panel. The firefighter's control panel actions shall be in accordance with Section 909.23.

909.16.3 Control action and priorities. The firefighter's control panel actions shall be in accordance with Section 909.23.

909.18 Acceptance testing. Devices, equipment, components and sequences shall be individually tested. These tests, in addition to those required by, the Fire Prevention Association of Nevada (FPAN) Uniform Guideline for Smoke Control Testing & Recertification and other provisions of this code, shall consist of determination of function, sequence and, where applicable, capacity of their installed condition.

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.

909.20.4.1 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 Maintenance. Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The system shall be maintained in accordance with the Fire Prevention Association of Nevada (FPAN) Uniform Guideline for Smoke Control Testing & Recertification, the manufacturer's instructions, and Sections 909.22.1 through 909.23.

909.22.4 Dedicated smoke control systems. Dedicated smoke control systems shall be operated for each control sequence semiannually. The system shall be tested under standby power conditions. When approved by the code official, the system may be tested under normal power conditions.

909.22.5 Nondedicated smoke control systems. Nondedicated smoke control systems shall be operated for each control sequence annually. The system shall be tested under standby power conditions. When approved by the code official, the system may be tested under normal power conditions.

909.23 Firefighter's Smoke Control Panel for Mechanical Smoke Control Systems.

909.23.1 Scope. This section applies to requirements regarding the design, installation, operation, and approval process for a Firefighter's Smoke Control Panel for Mechanical Smoke Control Systems.

909.23.2 Required items. The Firefighter Smoke Control Panel shall provide graphics depicting the protected facility and smoke control fan locations. The panel shall provide control switches to allow manual override and control of smoke control systems within the facility. Light Emitting Diodes (LEDs) shall be provided on the panel for the purpose of annunciation of smoke control systems, smoke control fans, smoke control dampers, and additional items as described.

909.23.2.1 Graphic display. The building layout must be graphically represented to clearly indicate location and boundaries of smoke zones with respect to adjacent areas. All walls and doors comprising the egress system for all smoke control zones must be shown on the graphics layout. The majority of graphics will be shown on a plan view. An exception is allowed for high-rise buildings having common floor plans and one smoke zone per high-rise floor, where a section view of the tower can be allowed in conjunction with plan views of typical tower floors. At a minimum, the panel must satisfy the following requirements:

1. Show a north directional arrow.
2. Show a building layout at an indicated scale on a contrasting background; black and white are acceptable colors for the graphic outlines and for the panel background.
3. The maximum height of any portion of the panel shall be 7'-0" above the finished floor, and the minimum height of any portion of the panel shall be 2'-6" from the floor.
4. Include a panel title block, indicating the facility name and address, and the title "Firefighter Smoke Control Panel."
5. Label each smoke zone area; the label shall include the floor level, i.e., SZ 16-I shall be the first smoke zone on the 16th floor. Note: when the floor level above grade is different than the floor designation, provide both numbers; i.e. if the 3rd level above grade is designated as level 15 in the elevators; provide both designations on the panel.
6. Designate between active and passive smoke zones by shading/background.
7. Show all floor and roof levels for all areas.
8. Label the locations of the Fire Command Center, Fire Pump, and Emergency Generators, elevators providing access to all floor and roof levels, stairs providing access to all floor and roof levels, and Secondary Response Point.
9. Show the location of all fan units providing smoke control function (both automatic and mop-up fans) and clearly indicate the direction of airflow from each smoke zone to the fan unit protecting that zone. Labels must be provided for each fan and for each opening associated with a fan. Therefore, if there is a fan on the building roof that serves the first level by exhausting air through an opening on the first level, the fan unit, clearly labeled, must be shown on the roof graphic, and the exhaust opening must be shown on the first level, clearly labeled as an exhaust opening associated with the fan.
10. Label fans with a Hand/Auto switch allowing for manual control at the unit.
11. Contain LEDs as required. LED annunciation is required for each smoke zone (including passive zones utilizing only dampers), each smoke control fan, each group of smoke control dampers/doors, each stair pressurization fan, each elevator pressurization fan, each mop-up system, for "Abnormal Switch Position", and for

power. For smoke fans and pressurization fans, the associated LED shall be close to the graphical representation of the fan.

12. Contain switches for manual control/override of each smoke zone (including passive zones utilizing only dampers), each stair pressurization system, each elevator pressurization system, each mop-up system, and each elevator hoist way vent damper.
13. Contain a button for lamp test.
14. Provide a legend for all symbols, including fans, supply/exhaust openings, etc, and for the LEDs provided on the panel.

909.23.2.2 Control switches and buttons. Manual control switches must be provided at the panel. The switches shall allow for manual activation of smoke control sequences and override of automatic smoke control sequences. Control switches shall be provided for each individual active and passive smoke zone, for each stair and elevator pressurization system, for mop-up systems, and for elevator hoist way vents. Control switches shall be adjacent to LEDs associated with each switch. Switches shall be three-position, even for dual-mode smoke zones. Each physical position of the control switch shall be labeled, utilizing "smoke mode — auto — off" labels for smoke zones, "press — auto — off" labels for pressurization systems, "manual purge — auto — off" labels for mop-up systems, and "open — auto — close" labels for elevator hoist way vents.

Control switches shall be provided for:

1. Each smoke zone: the switch for the smoke zone is required to have "smoke mode — auto — off" positions labeled. In "smoke mode" the switch is required to activate all smoke control components, including fans, dampers, and doors, that are required to automatically activate to provide the smoke control function, as dictated on the smoke control diagrams. In the "off" position, the switch is required to move all fans and dampers to a "passive" mode by shutting down all fans and closing all dampers serving that zone. This switch in the "off' position shall not inhibit any stair pressurization or elevator pressurization systems from activating again under a separate scenario. In the "auto" position, the FACP function is allowed to dictate the status of the smoke control system.
2. Each pressurization system: a switch is required to provide manual control of the fan(s) providing air supply to pressurize an enclosure, such as an egress stair and an elevator machine room. The switch for each pressurization system is required to have "press — auto — off" positions labeled. In "press", the switch will activate all pressurization fans required for the pressurized enclosure. This switch in "press" will override automatic controls, including duct detector shut down of the fan. In the "off" position, the fan must be released from all initiation commands from the FACP; no other activation of a smoke control system by the FACP will override the "off" position and turn the fan back on. In the "auto" position, the FACP function will dictate the fan function.
3. Each mop-up system: the switch for each mop-up system that is only manually activated for mop-up purpose is required to have "manual purge — auto — off" positions labeled. In "manual purge" the switch will activate fans and dampers that are required to configure to achieve the exhaust mode. In the "auto" position, the normal building function will dictate the functioning of all fans and dampers. In the "off" position the switch is required to move all fans and dampers to a "passive" mode by shutting down all fans and closing all dampers serving that zone.

4. Each elevator hoist way vent: the switch for each elevator hoist way vent is required to have "open — auto — close" positions labeled. In "open" the switch will open the elevator hoist way vent dampers. In the "auto" position, the FACP will dictate the status of the vent dampers, with respect to the lobby smoke detectors associated with the hoist way. In the close position the switch is required to move the damper to a "passive" mode by closing the damper.

Switches shall be located on the Firefighter Smoke Control Panel reasonably close to the graphical depiction of the associated area/component. There is no requirement for a separate control switch for a smoke control fan or fire dampers that are part of an automatic sequence.

909.23.2.3 Annunciation. Status of smoke control systems and components are required to be indicated on the Firefighter's Smoke Control Panel. Status shall be provided for general conditions, each individual smoke zone, each smoke control fan, each pressurization fan, and all dampers/doors. Status shall be indicated using LEDs. Acceptable LED colors are red, yellow, green, and blue. Red-yellow-green LED sets shall be provided for each smoke zone, smoke control fan (including mop-up fans), damper/group of dampers, and each pressurization fan. Dual-mode zones and fans shall be provided with red-yellow-green-blue LED sets.

909.23.3 General LED Status. There are general panel status situations that are required to be indicated by LEDs. These include whether there is power to the panel, and whether any switch on the panel has been moved from "auto" to another position.

909.21.3.1 General, yellow: There shall be a yellow indicator light that will illuminate when any switch on the fire-fighter's smoke control panel has been turned from "auto" or set to any position that will override automatic function of a smoke control system or component. The label adjacent to the yellow LED shall state "Abnormal Switch Position."

909.23.3.2 General, green: There shall be a green indicator light that will illuminate to indicate that the Firefighter's Smoke Control Panel is powered. The label adjacent to this green LED shall state "Power On."

909.23.3.3 LED legend: A legend of LEDs shall be provided. The legend LED shall continuously be lit. The legend shall indicate the following colors and labels:

1. Red LED — Smoke Mode
2. Yellow LED — Trouble
3. Green LED — Normal
4. Blue LED — Ancillary Smoke Mode (only for dual mode fans and zones)

909.23.3.4 Smoke Control Components. LEDs are required to indicate status of the smoke control system components. LEDs shall be provided for Smoke Zones, Smoke Control Fans, Mop-Up Systems, Smoke Zone Dampers/Doors, Elevator Hoist Way Vents, and Pressurization Systems. All of these shall have red-yellow-green LED sets. Dual-mode zones and fans shall add a blue LED for indication of the ancillary smoke mode.

The various LEDs shall operate as follows:

1. Red Only: Shall be illuminated when the FACP or the associated manual switch is activating the smoke control zone and/or components and all components required to activate have been monitored to be in the required position/operation for that scenario.

2. Green Only: Shall be illuminated to indicate normal mode when there is no initiation by the FACP or associated manual switch for the smoke zone and components and all required status for smoke control components indicate that the components are ready for operation.
3. Blue Only: Shall be illuminated when the FACP or the associated manual switch is initiating the smoke control zone and/or components into its ancillary smoke control mode and the monitoring for the fan and dampers required to achieve the ancillary smoke control mode indicates that the system is operating in its required mode. An ancillary smoke control mode means that the smoke zone served by the smoke control system is not in alarm, but the system must configure to support smoke control for another smoke zone that is in alarm.
4. Yellow Only: There shall be no situation where only a yellow LED is illuminated. The yellow LED shall only illuminate in conjunction with a blue LED, red LED or green LED.
5. Red and Yellow: A combination of the red and yellow LEDs shall illuminate to indicate that the smoke zone and/or component is being initiated by the FACP or the associated manual switch, and positive status indicating proper configuration of smoke zone components has not been received.
6. Green and Yellow: A combination of green and yellow LEDs shall illuminate when a smoke zone is not initiated and the smoke control components do not report normal operating status. For instance, this may occur when a damper is closed due to loss of power, or there is a loss of power required for a smoke control fan.
7. Blue and Yellow: A combination of the blue and yellow LEDs shall illuminate to indicate that an auxiliary smoke control sequence is being initiated by the FACP or the associated manual switch, and positive status indicating proper configuration of components for the ancillary smoke control mode has not been received.

909.23.4 Sequence of operations. Smoke control sequences shall be programmed such that operation of fans and dampers associated with the smoke control system does not result in physical damage in any smoke control system components.

909.23.4.1 Multiple configurations. In no case is the smoke control system required to configure for more than one smoke zone at the same time.

909.23.4.2 Operation and timing. Upon automatic activation of a device programmed to initiate a smoke control system, the smoke control system shall automatically configure all smoke control components in a manner to avoid damage to components. All components shall be configured to smoke control status and annunciation of status shall be indicated on the Firefighter Smoke Control Panel within 60 seconds of the initiating alarm being received at the FACP.

909.23.4.3 Automatic activation. Under automatic-only activation, the smoke control system shall configure components in the zone where the first device that initiates smoke control is activated.

909.23.4.4 Manual activation. Under manual-only activation, the smoke control system shall configure components to their proper smoke mode operation in the zone associated with the manual switch.

909.23.4.5 Stacked automatic and manual activations. For stacking of automatic and manual switch activation, the manual switch shall have override capability over the automatic sequence.

909.23.4.6 Switch overrides. Switches for pressurization fans shall not override manual or automatic function for smoke control systems covering areas or zones. Similarly, switches for a smoke zone shall not override manual or automatic function for pressurization fans.

909.23.5 Approval requirements

909.23.5.1 Submittals. Submittals shall include, plans for all proposed smoke control graphic panels, narrative describing the sequence and operation for all LEDs and switches, and a copy of the approved smoke control diagrams for review.

909.23.5.2 Plans. Plans shall be drawn to an indicated scale. Panel drawings must indicate location of switches and LEDs against the panel outline.

909.23.5.3 Narrative. The narrative shall indicate compliance with section 909 and describe the initial and override sequence for all buttons and switches shown on the graphic panel. The narrative shall be formatted as an instruction sheet. Copies of the approved narrative shall be laminated and attached to the Firefighter Smoke Control Panel for use by the Fire Department in an emergency. The narrative must describe:

1. General operation of smoke control systems.
2. LED operation for automatic and manual switch sequence of each smoke zone and/or component.
3. Override of control switch for each smoke zone and smoke control component.

909.23.5.4 Testing. Testing of the smoke control panel operation must be included in the third-party testing of the smoke control system. Final acceptance includes approval of the third-party test report and testing of the LEDs and control switches at the final All-Systems test.

Section 909.18.8.3

Revise Section 909.18.8.3 as follows:

909.18.8.3 Reports. A complete report of testing shall be prepared by the *approved 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 sign, seal 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 applicable smoke control system(s) are 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.

Sections 910.1, 910.2, & 910.6, 910.6.1 & 910.6.2

Revise Sections 910.1, 910.2, & 910.6, 910.6.1 & 910.6.2 as follows:

910.1 General. Where required by this code or otherwise installed, smoke and heat vents or smoke removal systems shall conform to the requirements of this section.

910.2 Where required. Smoke and heat vents or a smoke removal system shall be installed as required by Sections 910.2.1, 910.2.2, and 910.6.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an *approved automatic sprinkler system*.
2. Smoke and heat removal shall not be required in areas of buildings equipped with early suppression fast-response (ESFR) sprinklers.
3. Smoke and heat removal shall not be required in areas of buildings equipped with control mode special application sprinklers with a response time index of 50(m × s)1/2 or less that are *listed* to control a fire in stored commodities with 12 or fewer sprinklers.

910.6 High rise buildings. Smoke removal systems in high rise buildings shall be installed in accordance with Section 403.4.7 of the *International Building Code*.

910.6.1 Status Indicators and Controls. Status indicators and controls shall be designed in accordance with Section 403.4.7.1.4 of the *International Building Code* and the fire code official's guidelines.

910.6.2 Maintenance. Smoke removal systems in high rise buildings 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 Fire Prevention Association of Nevada (FPAN) Uniform Guideline for Smoke Control Testing & Recertification using a Level I inspection firm, and the manufacturer's instructions.

Section 912.4.2

Revise Section 912.4.2 as follows:

912.4.2 Clear space around connections. A working space of not less than 36 inches (914 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 fire department connection may be permitted within 36 inches (914 mm) of the fire riser room door opening as long as it is mounted on the opposite side of the hinges.

Section 913.1.1

Add new Section 913.1.1 as follows:

913.1.1 Redundant pumps in high-rise structures. Where pumps are used in structures with an occupied floor or occupied roof located greater than 250 feet (76 200 mm) above the lowest level of fire department vehicle access, a redundant fire pump shall be provided for each required fire pump.

Section 913.1.2

Add new Section 909.18.8.3 as follows:

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

> **Exception:** Where a single building is constructed above a podium building in accordance with Section 510.2 of the *International Building Code*, a redundant fire pump configuration is not required.

Section 913.1.3

Add new Section 913.1.3 as follows:

913.1.3 Where redundant pumps are required, electric driven fire pump drivers will be provided with emergency power.

> **Exception:** Where an alternatively powered redundant pump is utilized, i.e. electric primary and diesel, or other non-electric, secondary pump driver is provided, emergency power is not required for electric, primary, fire pump driver.

Section 913.2.3

Add new Section 913.2.3 as follows:

913.2.3 Drains. Floor drains having a minimum diameter of 3 inches (76.2 mm) shall be provided in the fire pump room.

Section 914.3.1

Revise Section 914.3.1 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.

Section 914.3.2

Revise Section 913.2.3 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 requirement in accordance with Section 903.3.1.1, but not less than 15,000 usable gallons (56 781 L), 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 as determined by the occupancy hazard classification in accordance with Section 903.3.1.1.

Sections 914.3.2.1 – 914.3.2.1.3

Add new Sections 914.3.2.1 – 9.4.3.2.1.3 as follows

914.3.2.1 Secondary water supply design options. Secondary water tanks that intercept the water supply shall be designed to allow for continued fire protection when the secondary tank is taken out of service in accordance with 914.3.2.1.1 through 914.3.2.1.3.

914.3.2.1.1 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.

914.3.2.1.2 For secondary water tanks supplying vertical turbine pump(s) or other fire pump(s) that cannot accept a piped supply, the secondary water supply shall be split into two separate tanks, each not less than one half 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.

914.3.2.1.3 Alternate engineering solution that provides a water supply while the secondary tank is out of service approved by the *fire code official*.

Section 914.4.1

Revise Section 914.4.1 as follows:

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

Section 914.6.1

Revise Section 914.6.1 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.*
3. Sprinklers are not required under catwalks and galleries where they are permitted to be omitted in accordance with Section 903.3.1.1.

Section 914.8.3

Revise Section 914.8.3 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 on the classification for the hangar given in Table 914.8.3.

Exception: For the protection of aircraft storage and servicing areas of Group II aircraft hangars where hazardous operations, including but not limited to fuel transfer, welding, torch cutting, torch soldering, doping, hot work (e.g., welding, cutting, brazing, grinding), spray painting, oxygen service, composite repairs, fuel system or fuel tank maintenance, aircraft cabling, wiring changes, or initial electrical system testing, are not performed, a closed-head automatic sprinkler system in accordance with NFPA 409 shall be permitted.

Table 1006.2.1

Revise portions of Table 1006.2.1 as follows:

[BE] TABLE 1006.2.1 – SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY				
OCCUPANCY	**MAXIMUM OCCUPANT LOAD OF SPACE**	**MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)**		
		Without Automatic Sprinkler System (feet)		**With Automatic Sprinkler System (feet)**
		Occupant Load		
		OL ≤ 30	**OL > 30**	
R-1	20	NP	NP	125[a]

(All other portions of the table and all footnotes remain unchanged.)

Section 1009.8.1

Revise Section 1009.81 as follows:

1009.8.1 System Requirements. Two-way communication systems shall provide communication between each required location and the *fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a constantly attended location, the two-way communication system shall have a timed automatic telephone dial-out capability that provides two-way communication with an *approved* supervising station. The two-way communication system shall include both audible and visible signals. Systems shall be listed in accordance with UL 2525 and installed in accordance with NFPA 72.

Section 1010.1.7

Revise Section 1010.1.7 as follows:

[BE] 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*.

Section 1027.5

Revise Section 1027.5 as follows:

[BE] 1027.5 Location. *Exterior exit stairways* and *ramps* shall be separated by a minimum distance of 10 feet (3048 mm) measured at right angles from the exterior edge of the *stairway* or *ramps*, including landings, to:

1. Adjacent lot lines or to the centerline of a street, alley or public way.
2. Other portions of the building and other buildings on the same lot.

For the purposes of this section, other portions of the building shall be treated as separate buildings.

Exceptions:

1. *Exterior exit stairways* and *ramps* serving individual *dwelling units* of Group R-3 shall be separated by a minimum distance of 5 feet (1524 mm).
2. Where the adjacent building exterior walls and openings are protected in accordance with Section 705 of the *International Building Code* based on *fire separation distance*.

Section 1030.2

Revise Section 1030.2 as follows:

[BE] 1030.2 Assembly main exit. A *building*, room or space used for assembly purposes that has an *occupant load* greater than 300 shall be provided with a *main exit*. The *main exit* shall be of sufficient capacity to accommodate not less than one-half of the *occupant load*, but such capacity shall be not less than the total required capacity of all *means of egress* leading to the *exit*. Where the *building* is classified as a Group A occupancy, the *main exit* shall front on not less than one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or *public way*. In a *building*, room or space used for assembly purposes where there is not a well-defined *main exit* or where multiple *main exits* are provided, *exits* shall be permitted to be distributed around the perimeter of the *building* provided that the total capacity of egress is not less than 100 percent of the required capacity.

Section 1030.6.2.3

Revise Section 1030.6.2.3 as follows:

[BE] 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.

Section 1030.6.3.1

Revise Section 1030.6.3.1 as follows:

[BE] 1030.6.3.1 Automatic Sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing *open-air assembly seating* shall be protected with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

Exception: *Open-air assembly seating* facilities where seating and the *means of egress* in the seating area are essentially open to the outside.

Chapter 11

Revise Chapter 11 as follows:

Chapter 11 is deleted in its entirety. All references to Chapter 11 throughout this code are also deleted. The edition of the IEBC referenced in Chapter 80 shall be applicable.

Section 2007.5

Revise Section 2007.5 as follows:

2007.5 Standpipe systems. A building with a rooftop helistop or heliport shall be provided with a Class I standpipe system extended to the roof level on which the helistop or heliport is located. All portions of the helistop and heliport area shall be within 100 feet (30 480 mm) hose and 30 feet (9144 mm) stream of a 2 ½-inch (63.5 mm) outlet on the standpipe system.

Section 2304.2.4

Revise Section 2304.2.4 as follows:

2304.2.4 Obstructions to view. The attendant shall have a direct line of sight to observe fuel-dispensing operations at all times. Obstructions shall not be placed between the dispensing area and the attendant.

Exception: Video monitoring systems or other acceptable alternatives shall be permitted to supplement direct line of sight supervision where *approved* by the *fire code official.* Plans documenting camera and video monitor locations or other alternatives shall be submitted to the *fire code official* for review and approval prior to installation.

Section 2404.4

Revise Section 2404.4 as follows:

2404.4 Location of spray-finishing operations. Spray finishing operations conducted in building areas used for Group A, E, I or R occupancies shall be located in a spray room protected with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 and

separated vertically and horizontally from the remainder of the building by *fire barrier* walls and *horizontal assemblies* with not less than a 1-hour *fire-resistance rating* in accordance with the *International Building Code*. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth, or limited spraying space *approved* for such use.

Exceptions:

1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with *approved* natural or mechanical ventilation shall be exempt from the provisions of Section 2404 when *approved* and where utilizing Class IIIA or IIIB *combustible liquids*.
2. In buildings other than Group A, E, I or R occupancies, *approved* limited spraying space in accordance with Section 2404.11.
3. Resin application areas used for manufacturing of reinforced plastics complying with Section 2409 shall not be required to be located in a spray room, spray booth or spraying space.

Section 3103.3

Revise Section 3103.3 as follows:

3103.3 Outdoor assembly event. For the purpose of this chapter, an outdoor assembly event shall include a circus, carnival, fair, tent show, theater, skating rink, dance hall or other place of assembly in or under which persons gather for any purpose.

Section 3103.7.4

Revise Section 3103.7.4 as follows:

3103.7.4 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*.

Section 3201.3

Revise Section 3201.3 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 *construction documents* shall include the following:

1. Floor plan of the building showing locations and dimensions of *high-piled storage areas*.

2. Usable storage height for each storage area
3. Number of tiers within each rack, if applicable.
4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
5. Aisle dimensions between storage array.
6. Maximum pile volume for each storage array.
7. Location and classification of commodities in accordance with Section 3203.
8. Location of commodities which are banded or encapsulated.
9. Location of required fire department access doors.
10. Type of fire protection systems.
    10.1. 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.
    10.2. 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. Location of valves controlling the water supply of ceiling and in-rack sprinklers.
12. Type, location, and specifications of smoke removal and curtain board systems.
13. Dimension and location of transverse and longitudinal flue spaces.
14. Additional information regarding design features, commodities, storage arrangement and fire protection features within the *high-piled storage area* shall be provided at the time of permit, where required by the *fire code official*.
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.

Section 3307

Revise Section 3307 including new sections as follows:

3307.2 Water supply for fire protection. An *approved* water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible building materials arrive on the site, on commencement of vertical combustible construction and on installation of a standpipe system in buildings under construction, in accordance with Sections 3307.2.1 through 3307.4. The required volume of fire flow shall be based on the fire flow required for the

building/facility when constructed, with reductions permitted as set forth in this section. In all cases, a minimum fire flow of 1,500 gpm (5678 L/m) shall be required.

Exception: The *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

3307.2.1 Combustible building materials. When combustible building materials of the building under construction are delivered to a site, the fire hydrant used to provide this fire-flow supply shall be within 300 feet (91.44 m) of the combustible building materials, as measured along an *approved* fire apparatus access lane. Where the site configuration is such that one fire hydrant cannot be located within 300 feet (91.44 m) of all combustible building materials, additional fire hydrants shall be required to provide coverage in accordance with this section.

3307.2.2 Vertical construction of Types III, IV and V construction. Prior to commencement of vertical construction of Type III, IV or V buildings that utilize any combustible building materials, the fire flow required by Section 3307.2 shall be provided, accompanied by fire hydrants in sufficient quantity to deliver the required fire flow and proper coverage.

3307.2.2.1 Fire separation up to 30 feet. Where a building of Type III, IV or V construction has a fire separation distance of less than 30 feet (9144 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide either a minimum of 1500 gallons per minute (5678 L/m) or the entire fire flow required for the building when constructed, whichever is greater.

3307.2.2.2 Fire separation of 30 feet up to 60 feet. Where a building of Type III, IV or V construction has a fire separation distance of 30 feet (9144 mm) up to 60 feet (18 288 mm) from property lot lines, and an adjacent property has an existing structure or otherwise can be built on, the water supply shall provide a minimum of 1500 gallons per minute (5678 L/m) or 50 percent of the fire flow required for the building when constructed, whichever is greater.

3307.2.2.3 Fire separation of 60 feet or greater. Where a building of Type III, IV or V construction has a fire separation of 60 feet (18 288 mm) or greater from a property *lot line*, a water supply of 1500 gallons per minute (5678 L/m) shall be provided.

3307.3 Vertical construction, Type I and II construction. If combustible building materials are delivered to the construction site, water supply in accordance with Section 3307.2.1 shall be provided. Additional water supply for fire flow is not required prior to commencing vertical construction of Type I and II buildings.

3307.4 Standpipe supply. Regardless of the presence of combustible building materials, the construction type or the *fire separation distance*, where a standpipe is required in accordance with Section 3307.5, a water supply providing a minimum flow of 1500 gallons per minute (5678 L/m) shall be provided. The fire hydrant used for this water supply shall be located within 100 feet (30 480 mm) of the fire department connection supplying the standpipe.

3307.5 Standpipes. In buildings required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed prior to construction exceeding 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipes shall be provided with fire department hose connections at locations adjacent to *stairways* complying with Section 3307.1.2. As construction progresses, such standpipes shall be extended to within one floor of the highest point of construction having secured decking or flooring.

3307.5.1 Buildings being demolished. Where a building is being demolished and a standpipe is existing within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

3307.5.2 Detailed requirements. Standpipes shall be installed in accordance with the provisions of Section 905.

Exception: Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes comply with the requirements of Section 905 as to capacity, outlets and materials.

3307.6 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.

3307.7 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*.

Section 3307.8

Add new Section 3307.8 as follows:

3307.8 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, building 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 (305 mm), 1" (25 mm) stroke numbering and lettering.

Section 3604.2

Revise Section 3604.2 as follows:

3604.2 Standpipes. Marinas and boatyards shall be equipped throughout with standpipe systems in accordance with NFPA 303. Systems shall be provided with hose connections located such that no point on the marina pier or float system exceeds 100 feet (30 480 mm) hose and 30 feet (9144 mm) stream from a standpipe hose connection.

Section 3903.3

Revise Section 3903.3 as follows:

3903.3 Location. The extraction equipment and extraction processes utilizing hydrocarbon solvents or other organic liquids shall be located in a room or area dedicated to extraction. A listed spray booth conforming to the requirements of Section 2404.5.3 or a pre-engineered extraction booth may be used for this purpose.

Section 3903.5

Revise Section 3903.5 as follows:

3903.5 Use of flammable and combustible liquids. The use of *flammable* and *combustible liquids* for liquid extraction processes where the liquid is boiled, distilled or evaporated shall be located within a hazardous exhaust fume hood or pre-engineered extraction booth, rated for exhausting flammable vapors. Electrical equipment used within the hazardous exhaust fume hood or pre-engineered extraction booth shall be rated for use in flammable atmospheres. Heating of *flammable* or *combustible liquids* over an open flame is prohibited.

Exception: The use of a heating element not rated for flammable atmospheres, where documentation from the manufacturer, or *approved* testing laboratory indicates the element is rated for heating of *flammable liquids*.

Sections 3905.1 & 3905.1.1

Revise Sections 3905.1 & 3905.1.1 as follows:

3905.1 Gas detection. For extraction processes utilizing flammable or combustible liquids or gases as solvents, a *gas detection system* complying with Section 916 shall be provided.

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

1. Initiation of distinct audible and visual alarm signals in the extraction room.
2. Deactivation of all heating systems located in the extraction room.
3. Activation of the mechanical ventilation system where the ventilation rate provided is such that the air velocity over the cross-section of the extraction room in the direction of air flow is a minimum of 100 linear feet per minute.
4. De-energize all light switches and electrical outlets.

Section 4104.2

Revise Section 4104.2 as follows:

4104.2 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* and *townhouses*.
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.

Section 4105.1

Revise Section 4105.1 as follows:

4105.1 Portable electric cooking appliances. Portable electric cooking appliances shall be permitted to be used in all occupancies in accordance with Sections 4105.1.1 through 4105.2.

Section 4105.2

Add new Section 4105.2 as follows:

4105.2 Open-flame cooking devices. Electric barbecues and other portable electric cooking appliances that have the potential to produce open flames, 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* and *townhouses*.
2. Where buildings, balconies and decks are protected by an *automatic sprinkler system*.

Chapter 49

Add new Chapter 49 as follows:

CHAPTER 49

MID-RISE BUILDINGS

4901 Applicability. In addition to the provisions of the *International Building Code* Section 429 *Mid-Rise Buildings* shall comply with Sections 4902 through 4905.

Exception: The provisions of Sections 4902 through 4905 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.

4904 Fire Command Center. A *fire command center* complying with Section 508 shall be provided in a location *approved* by the *fire code official*.

4905 Fire Protection Report. When required by the *fire code official*, a fire protection report shall be submitted.

Section 5003.2.2.1

Revise Section 5003.2.2.1 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. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.
2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.
3. Manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing and provided with *ready access* at the following locations:

   3.1. The point of use.

   3.2. The tank, cylinder or bulk source.
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be clearly visible, provided with *ready access* and identified in an *approved* manner.
5. Backflow prevention or check valves shall be provided where the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

   Exceptions:

   1. Piping for inlet connections designed to prevent backflow.

   2. Piping for pressure relief devices.
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.

Section 5003.11

Revise Section 5003.11 as follows:

5003.11 Group M storage and display and Group S storage. For one-story buildings and for multistory mixed-occupancy buildings not containing occupancy groups A, E, I, or R, the aggregate quantity of hazardous materials stored and displayed within a single *control area* of a Group M occupancy, or an outdoor *control area*, or stored in a *single control* area of a Group S occupancy, is allowed to exceed the *maximum allowable quantity per control area* indicated in Section 5003.1 where in accordance with Sections 5003.11.1 through 5003.11.2.

Section 5305.11

Add new Section 5305.11 as follows:

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 ft^3/lbs 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.

Section 5306.6

Revise Section 5306.6 as follows:

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 owner's 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:
    9.1. Point of compass (north arrow).
    9.2. Walls, doors, windows, openings, stairs, elevators, passageways, high-piled storage racks, etc., as applicable to depict the facility.
    9.3. Room use identification labels.
    9.4. Gas, air and vacuum piping distribution systems, manifolds, sizes and material types. Piping hangers and slopes.
    9.5. Valves and valve boxes, outlets, gages and other components.
    9.6. Electrical warning systems (local and master alarm panels), conductor/conduit routing and size, power panel and circuit connection.
    9.7. Key plan.
    9.8. Compressor inlet location and vacuum exhaust outlet location.
    9.9. 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.

Section 5306.7

Revise Section 5306.7 as follows:

5306.7 Medical gas systems testing. Hyperbaric systems and medical gas systems required by NFPA 99 to be verified by a 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 installer. The *fire code official* may witness any or all testing. Copies of the system certification shall be provided to the *fire code official*.

Section 5307.3.2

Revise Section 5307.3.2 as follows:

5307.3.2 Gas detection system. Where ventilation is not provided in accordance with Section 5307.3.1, a *gas detection system* complying with Section 916 shall be provided in rooms or indoor areas and in below-grade outdoor locations with insulated carbon dioxide systems. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is expected to accumulate or other *approved* locations. The system shall be designed as follows:

1. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m^3).
2. Activates an audible and visible alarm within the room or immediate area where the system is installed 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).

Section 5601.1.3

Revise Section 5601.1.3 as follows:

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

Exceptions:

1. Storage and handling of fireworks as allowed in Section 5604.
2. Manufacturer, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with the 2006 edition of NFPA 1124, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100-185, as applicable for consumer fireworks.
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.

Section 5601.2.2

Revise Section 5601.2.2 as follows:

5601.2.2 Sale and retail display. All sales and retail displays of fireworks, *explosives*, or *explosive materials* 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.

Section 5601.2.4

Revise Section 5601.2.4 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, 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 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 any and all damages arising from permitted blasting.

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.

Section 5601.5

Revise Section 5601.5 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.

Section 5603.8

Revise Section 5603.8 as follows:

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.

Section 5604.1

Revise Section 5604.1 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*.

Section 5604.6.5.2

Revise Section 5604.6.5.2 as follows:

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

Section 5604.7.1

Revise Section 5604.7.1 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* or inspection. In addition to the locking requirements, the following security measures shall be required at all *explosives* 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.

Section 5605.1

Revise Section 5605.1 as follows:

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

Exceptions:

1. The hand loading of small arms ammunition prepared for personal use and not offered for resale.
2. The mixing and loading of blasting agents at basting sites in accordance with NFPA 495.
3. The use of binary *explosives* or plosophoric materials in blasting or pyrotechnic special effects applications in accordance with NFPA 495 or NFPA 1126.
4. Subject to approval of the *fire code official* and obtaining proper approvals from the planning and zoning authority.

Sections 5607.3 – 5607.3.2

Revise Sections 5607.3 – 5607.3.2 as follows:

5607.3 Blasting. Where blasting is done in close proximity to a structure, railway or highway, development, quarry, or any other installation, precautions shall be taken to minimize earth vibrations and air blast effects. Blasting mats or other protective means shall be used to prevent fragments from being thrown.

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 Section 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*.

Section 5607.4

Revise Section 5607.4 as follows:

5607.4 Restricted hours. Blasting operations shall be limited to the hours of 8:00am to 4:00pm, Monday through Friday, excluding state-recognized holidays unless otherwise *approved* by the *fire code official*.

Section 5607.5

Revise Section 5607.5 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 situation, the time limit shall not apply where *approved*.

Section 5607.6

Revise Section 5607.6 as follows:

5607.6 Electric or electronic detonator precautions. Precautions shall be taken to prevent accidental discharge of electric or electronic detonators from currents induced by radar and radio transmitters, lightning, adjacent power lines, dust and snowstorms, or other sources of extraneous electricity.

Section 5607.13

Revise Section 5607.13 as follows:

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

1. The blaster has made certain that all surplus *explosive materials* are in a safe place and 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 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 Section 5607.14(4).

Section 5607.14

Revise Section 5607.14 as follows:

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

1. Persons shall not return to the blast area until allowed to do so by the blaster in charge.
2. The blaster shall allow sufficient time for smoke and fumes to dissipate and for dust to settle before returning to or approaching the blast area.
3. The blaster shall inspect the entire blast site for misfires before allowing other personnel to return to the blast area.
4. The blaster shall sound an all-clear warning signal in accordance with Section 5607.13.1.

Section 5608.1

Revise Section 5608.1 as follows:

5608.1 General. Outdoor fireworks displays, use of pyrotechnics before a *proximate audience* 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 160, NFPA 1123, or NFPA 1126.

Sections 5704.2.9.2 & 5704.2.9.2.5

Revise Sections 5704.2.9.2 & 5704.2.9.2.5 as follows:

5704.2.9.2 Fire protection. Fire protection for above-ground tanks shall comply with Sections 5704.2.9.2.1 through 5704.2.9.2.5.

5704.2.9.2.5 Fire flow. Fire flow shall be based on the flashpoint 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 four hours.

TABLE 5704.2.9.2.5(a) FIRE FLOW FOR TANKS STORING FLAMMABLE AND COMBUSITBLE LIQUIDS[a]		
FLASH POINT OF LIQUID	**LARGEST TANK**	**LARGEST EXPOSED TANK**
<140°F (60°C)	1000 gpm[b]	500 gpm[b]
≥140°F (60°C)	750 gpm	250 gpm
For SI: 1 gallon per minute = 3.785L/m. a. Required flows may be reduced by half for horizontal tanks. b. Add 250 gpm for each 100ft. 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 (feet)	**WATER DEMAND (gallons per minute)**
50	200
100	800
150	2000
200	3200
250	5000
300	7100
For SI: 1 foot = 3048 mm, 1 gallon per minute = 3.785L/m.	

Section 5704.2.13.1.3

Revise Section 5704.2.13.1.3 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. Coordination and compliance with Environmental Health Division of Southern Nevada Health District for tank removal is the responsibility of the owner and contractor.

Section 5704.2.13.1.4

Delete Section 5704.2.13.1.4.

Section 5704.5

Add new Section 5704.5 as follows:

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.

Section 5706.5.1.6

Revise Section 5706.5.1.6 as follows:

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

Section 5706.5.4.5

Revise Section 5706.5.4.5 as follows:

5706.5.4.5 Commercial, industrial, governmental or manufacturing. Dispensing of Class I, II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where *approved*, provided that 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.

Items 2-25 unchanged.

Section 6104.2

Revise Section 6104.2 as follows:

6104.2 Maximum capacity within established limits. For the protection of heavily populated or congested areas, storage of liquified petroleum gas shall not exceed an aggregate water capacity in any one installation of 2,000 gallons (7570 L) within the limits established by law as set forth in the fire code adoption ordinance or other regulation adopted by the jurisdiction.

Chapter 80

Revise Chapter 80 reference NFPA standards as follows:

NFPA

…

54-24 National Fuel Gas Code

…

140-24 Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations

…

(Note: The list before and after the revisions and insertions are unchanged)

Appendix B

Revise Appendix B 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)	(Intentionally left blank)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	(Intentionally left blank)	1,000	1
3,601 and greater	(Intentionally left blank)	50% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the required fire-flow rate

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

a. The reduced fire flow shall be not less than 1,000 gallons per minute.

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 Hangars 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*	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

Revise Appendix C as follows:

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 (152 400 mm).

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 (91 440 mm), 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 (91 440 mm), or 400 feet (121 920 mm) 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 (60 960 mm).

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 (30 480 mm) 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 (30 480 mm) only 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 (304 800 mm) along both sides of the street; arranged on an alternating basis at 500–foot (152 400 mm) 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 (304 800 mm) to provide water for transportation hazards.

C102.10 Hydrant Clearances from Structures. No fire hydrant shall be located within 6 feet (1829 mm) 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 (914 mm) 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 (1219 mm) to 7 feet (2134 mm) from the back of curb. Where it is not possible to locate the hydrant a minimum of 4 feet (1219 mm) 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 (914 mm) by 3 feet (914 mm), with a minimum depth of 10 inches (254 mm), 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 (200 mm), with a dead-end maximum length of 150 feet (45 720 mm) of 6-inch (150 mm) 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 onsite underground water mains and materials shall be UL listed, AWWA 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 (3785 L/m) per hydrant. All hydrants utilized in providing the fire flow shall be within 750 feet (228 600 mm) 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 (5678 L/m).

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 3307.2.

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 (4572 mm) 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 P

Revise Appendix P as follows:

Appendix P

PROPRIETARY SUPERVISING STATION FACILITIES

Section P101–General

P101.1 Scope. Proprietary supervising station facilities (self-monitoring facilities) shall meet all of the requirements of this appendix.

P101.2 Permit Required. The proprietary supervising station facility shall maintain an annual operational permit.

Section P102–Site Requirements

P102.1 Location. The proprietary supervising station shall be located in a property's Fire Command Center, or other approved location.

P102.1.1 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 P104.

P102.2 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 P103–Personnel

P103.1 Qualifications. Proprietary supervising stations shall be operated by trained personnel in constant attendance who are responsible to the owner of the protected property.

P103.1.1 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.

P103.2 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 P104 for the facility.

P103.3 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.

P103.4 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 P104–Standard Operating Procedures

P104.1 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 P105–Disposition of Signals

P105.1 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 P103.4 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.

P105.2 Supervisory signals. Upon receipt of a supervisory signal, the proprietary supervising station operator shall immediately dispatch a runner to the location identified on the fire alarm control unit, unless the supervisory conditions are promptly restored.

P105.3 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 P106–Record-Keeping

P106.1 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 Q

Revise Appendix Q as follows:

Appendix Q

FIRE PROTECTION SYSTEMS – IMPAIRMENTS AND SYSTEMS OUT OF SERVICE

Section Q101–IMPAIRMENT PROCEDURES

Q101.1 General. In addition to the requirements of Section 901.7, alternative protection measures shall be provided in accordance with this Appendix. Tables Q102.1(a) through Q103.1(b) shall be used by the impairment coordinator to determine the alternative protection measurers required.

Q101.2 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.

Q101.3 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 Q102.1(a) through Q103.1(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.

Q101.4 Impairment Procedure Tables. The impairment coordinator shall comply with impairment tables Tables Q102.1(a) through Q103.1(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.

Q101.4.1 Notify Dispatch. When required by Tables Q102.1(a) through Q103.1(b) the impairment coordinator shall notify the Fire Department dispatch center and fire code official.

Q101.4.2 Fire watch. When required by Tables Q102.1(a) through Q103.1(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 (9290 m^2) 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.

Q101.4.3 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.

Q102 Impairment Tables–Use Groups A, E, H, I and R

Q102.1 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 Q102.1(a) and Q102.1(b) to address impairments to fire protection systems. When alternative protection measures are required by Tables Q102.1(a) and Q102.1(b) the *fire code official* shall be contacted.

TABLE Q102.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
Fire Pump (standalone)	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
Fire Pump (with backup 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

TABLE Q102.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	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
		>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 System (NFPA 15)	N/A	≤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 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	N	N
Clean-agent (without sprinkler system inside 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

TABLE Q102.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	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 acts as a secondary supply only	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
Water Storage Tank (including pools used as tanks) – without redundant water mains and tank acts as a 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 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 Q102.1(b)–FIRE ALARM SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
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 (Stand-alone Nodes are available)	1	≤5 hours	Y	N
		>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

TABLE Q102.1(b)–FIRE ALARM SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	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
		>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 or 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
		≤5 hours	N	N

TABLE Q102.1(b)–FIRE ALARM SYSTEMS, USE GROUPS A, E, H, I and R				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	2-5	>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 (automatic mode works)	1	≤4 hours	N	N
		>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 work)	NA	NA	N	Y
Firefighter communication systems (fire phones and radio systems)	NA	NA	N	Y

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

Section Q103–Impairment Tables, Use Groups B, M, F, and S

Q103.1 Use Groups B, M, F, and S. Groups B, M, F, and S occupancies are considered lower hazard occupancies. The impairment coordinator shall use the following Tables Q103.1(a) and Q103.1(b) to address impairments to fire protection systems. When alternative protection measures are required by Tables Q103.1(a) and Q103.1(b), the *fire code official* shall be contacted.

Table Q103.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
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	≤10 hours	N	N
		>10 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 (No secondary water supply)	1	≤ 10 hours	Y	N
		>10 hours	Y	Y
	2-5	≤ 10 hours	Y	N
		>10 hours	Y	Y
	6 or more	≤2 hours	Y	N
		>2 hours	Y	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 10 hours	Y	N
		>10 hours	Y	Y
	2-5	≤10 hours	Y	N
		>10 hours	Y	Y
	6 or more	≤2 hours	Y	N
		>2 hours	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

Table Q103.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (system still operational)	1	≤ 10 hours	N	N
		> 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 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 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

Table Q103.1(a)–SUPPRESSION-BASED SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	6 or more	≤ 8 hours	N	N
	6 or more	> 8 hours	N	Y
Water storage tank (including pools used as tanks) – without redundant water mains and tank acts as a secondary supply only	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
Water storage tank (including pools used as tanks) – without redundant water mains and tank acts as a break tank for primary supply	1	≤ 8 hours	Y	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	Y	N
		> 4 hours	Y	Y
Obstructions in water supply – Lack of flushing/MIC	1	≤ 5 hours	N	N
		> 5 hours	Y	Y
	2-5	≤ 3 hours	N	N
		> 3 hours	Y	Y
	6 or more	≤ 1 hour	N	N
		> 1 hour	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 Q103.1(b)–FIRE ALARM SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
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
		> 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 notification circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
	2-5	> 5 hours	Y	N

TABLE Q103.1(b)–FIRE ALARM SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	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
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler or 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
		≤ 5 hours	N	N

TABLE Q103.1(b)–FIRE ALARM SYSTEMS, USE GROUPS B, F, M and S				
Impairment Description	**Building/Location Height – Stories Above Grade**	**Estimated Repair Time[a]**	**Fire Watch Req'd**	**Fire Watch Notify Dispatch and Fire Code Official for possible additional measures per section Q101.4.3**
	2-5	> 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
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Smoke Control Panel (automatic mode does not work)	NA	NA	N	Y
Firefighter communication systems (fire phones and radio systems)	NA	NA	N	Y

a. 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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Section 3.3.120

Revise as follows:

3.3.120* Limited-Combustible Material. Deleted in its entirety throughout this standard. This term shall have no ordinary accepted meaning as noted in Section 3.1 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 in the International Fire Code Section 102.7 and all applicable standards or requirements that are not set forth in this code as stated in the International Fire Code Section 102.8 when involving sprinkler systems.

Section 4.3.3.2

Revise as follows:

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

(1) Spaces or portions of other occupancies with moderate to high quantity and combustibility of contents

(2) Stockpiles of contents with moderate rates of heat release rate that do not exceed 12 ft (3.7 m) and stockpiles of contents with high rates of heat release that do not exceed 8 ft (2.4 m) in height

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

Section 4.3.8

Revise as follows:

4.3.8 Future Storage. In shell or spec group S1 occupancies, or storage areas of future or unknown use, the fire sprinkler system shall be designed to protect a class IV commodity to the maximum available storage height.

Section 4.4.5

Revise as follows:

4.4.5 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.

Section 4.4.7

Revise as follows:

4.4.7 Fire Alarm Notification Zones. Sprinkler systems serving a building with multiple fire alarm notification zones shall be defined by the same boundaries as the fire alarm notification zones. Sprinkler systems shall not cross over notification zone boundaries.

Section 8.1.3

Revise 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 allowable system size.

Section 8.2.3.1

Revise as follows:

8.2.3.1* The system capacity (volume) controlled by a dry pipe valve shall be determined by 8.2.3.2, 8.2.3.5, or 8.2.3.7.

Section 8.2.3.3

Delete Section 8.2.3.3.

Section 8.2.3.4

Delete Section 8.2.3.4.

Section 8.2.3.5

Revise 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.

Section 8.2.6.6.5.2

Revise as follows:

8.2.6.6.5.2 The air compressor shall be secured at all times.

Section 8.2.6.7.2.3

Revise as follows:
8.2.6.7.2.3 When a low or high air pressure condition is detected, notification shall be through the fire alarm control unit as a supervisory condition.

Section 8.3.2.3.1.3

Revise 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.

Section 8.6.2.3

Revise as follows:

8.6.2.3 An antifreeze solution shall be prepared with a freezing point at or below 2º F (-16.7º C).

Section 8.9.3.1

Revise 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.

Section 8.9.9

Revise as follows:

8.9.9 Dedicated Supply and 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.

Section 9.2.1.12

Delete Section 9.2.1.12.

Section 9.2.1.13

Delete Section 9.2.1.13.

Section 9.2.3.1

Revise as follows:

9.2.3.1* 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.

Section 9.2.3.2

Delete Section 9.2.3.2.

Section 9.2.4.1.1

Revise as follows:

9.2.4.1.1* Sprinkler protection shall be provided in all bathrooms.

Section 9.2.4.1.1.1

Revise as follows:

9.2.4.1.1.1 Sprinklers shall not be required in rooms that contain solely a toilet fixture, that contain no counters, shelving, closet doors, or other fixtures, that have a maximum area of 55 ft² (5.1m²), and that are not located under stairs that are part of the path of egress. Such rooms shall be surrounded by walls and doors that completely enclose the room.

Section 9.2.5.1

Revise as follows:

9.2.5.1 Sprinkler protection shall be provided in clothes closets, linen closets, and pantries.

Section 9.2.6

Delete Section 9.2.6.

Section 9.2.17

Delete Section 9.2.17.

Section 9.3.5.1

Revise 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 when required by the AHJ in combination with draft curtains in accordance with 9.3.5.2 and 9.3.5.3.

Section 9.3.11.1

Delete Section 9.3.11.1.

Section 9.3.11.2

Delete Section 9.3.11.2.

Section 9.3.11.3

Delete Section 9.3.11.3.

Section 9.3.11.4

Delete Section 9.3.11.4.

Section 9.3.11.5

Delete Section 9.3.11.5.

Section 9.3.19.1

Revise as follows:

9.3.19.1* Unless the requirements of 9.2.3.1, or 9.2.3.3 are met, sprinklers shall be installed under exterior projections exceeding 4 feet (1.2 m) in width.

Section 9.3.22

Revise as follows:

9.3.22 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 Sections 9.3.22.1 to 9.3.22.5.

9.3.22.1 Hydraulic Design. Systems shall meet Density/Area Method requirements of Section 19.2.3.2 or the Pipe Schedule method of Section 28.5. The minimum design shall be for Ordinary Hazard Group 2, or higher design to accommodate the hazard within the temporary exhibit booth.

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

9.3.22.3 Hangers. Hangers conforming to Section 17.1 shall be provided for temporary piping to temporary exhibit booths. Hangers shall be permitted to be attached to the temporary exhibit booth structure.

9.3.22.4 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.

9.3.22.5 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.

Section 9.3.23

Revise as follows:

9.3.23 Openings in Rated Assemblies. When sprinkler protection is serving as the alternative to required opening protectives in rated assemblies, such sprinklers shall be listed for use and installed in accordance with their listing. When required by the authority having jurisdiction, these sprinklers shall be supplied by a dedicated sprinkler system, controlled, monitored, and supplied independently of the overhead system(s).

Section 9.4.3.1

Revise 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 3.3.215.4.16

(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

Section 9.5.5.3.1.6

Revise as follows:

9.5.5.3.1.6 Sprinklers shall not be required under overhead garage doors within garages that service a single tenant in residential occupancies.

Sections 10.2.7.4.2.1, 10.3.6.3.2.1, 11.2.5.3.2.1 & 11.3.6.3.2.1

Revise as follows:

10.2.7.4.2.1 Sprinklers shall not be required under overhead garage doors within garages that service a single tenant in residential occupancies.

10.3.6.3.2.1 Sprinklers shall not be required under overhead garage doors within garages that service a single tenant in residential occupancies.

11.2.5.3.2.1 Sprinklers shall not be required under overhead garage doors within garages that service a single tenant in residential occupancies.

11.3.6.3.2.1 Sprinklers shall not be required under overhead garage doors within garages that service a single tenant in residential occupancies.

Section 16.2.7.7

Revise as follows:

16.2.7.7 A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet. The list shall be on a machine-engraved metal or rigid plastic sign with capitalized lettering having a minimum 14-point (1/4 inch high) Arial or similar font or as approved by the AHJ.

Section 16.9.3.3.1

Revise 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 sprinkler and other fixed water-based fire suppression systems shall be electrically supervised by a central station, proprietary, or remote station signaling service.

Section 16.9.3.3.2

Revise as follows:

16.9.3.3.2 Floor control valves in high-rise buildings shall comply with 16.9.3.3.1.

Section 16.9.3.3.3

Revise as follows:

16.9.3.3.3 The requirements of 16.9.3.3.1 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.

Section 16.9.10.1

Revise as follows:

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

Section 16.9.10.2

Revise as follows:

16.9.10.2 The floor control valve, check valve, pressure gauge, main drain valve, and flow switch required by 16.9.10.1 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 the protected floor system below.

Section 16.9.10.3

Delete Section 16.9.10.3.

Section 16.11.2.1

Revise as follows:

16.11.2.1 Local Waterflow Alarms. A local waterflow alarm shall be provided on every sprinkler system.

Sections 19.5.1 – 19.5.3

Revise as follows:

19.5 Non-Storage Occupancies with High Ceilings. Non-storage occupancies with ceiling heights in excess of 25 feet shall comply with Section 19.5 or an acceptable FM design. Where an FM design is used, all associated FM data sheets shall be complied with. For design criteria for Exhibition Spaces and Stages with Fly Galleries, see Section 19.6.

19.5.1 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.

19.5.2 Non-Storage Occupancies with Ceiling Heights over 50 feet. All structures, regardless of occupancy or hazard classification, with ceiling heights exceeding 50 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. Deluge systems shall be installed using sprinklers with a minimum k-factor of 11.2 with a maximum sprinkler discharge pressure of 30 psi.

19.5.3 Extra Hazard Occupancies with Ceiling Heights 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.

Sections 19.6.1 – 19.6.3

Revise as follows:

19.6 Sprinkler Protection for Exhibition Spaces and Stages with Fly Galleries. Sprinkler protection for exhibition spaces and stages with fly galleries shall comply with Section 19.6 or an acceptable FM design. Where an FM design is used, all associated FM data sheets shall be complied with.

19.6.1 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.

19.6.2 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.

19.6.3 Exhibition Spaces and Stages with Fly Galleries with Ceiling Heights over 60 feet. Exhibition spaces and stages with fly galleries with ceiling heights exceeding 60 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. 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.

Section 27.17.1

Revise as follows:

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

Section 28.2.1.7

Revise as follows:

28.2.1.7 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.

Section 28.2.1.8

Revise as follows:

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

Section 29.4.1

Revise as follows:

29.4.1 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 (1/4 inch high) in Arial or similar font secured to the riser it serves with corrosion-resistant wire, chain, or other approved means. Signs located at the system control riser shall be allowed to be combined with the General Information Sign described in 29.6.

Section 29.6.1.1

Revise as follows:

29.6.1.1 Such general information shall be provided with a machine-engraved weatherproof metal or rigid plastic sign with capitalized lettering a minimum 14 point (1/4 inch high) in Arial or similar font, secured with corrosion-resistant wire, chain, or other acceptable means.

NFPA 13D

Section 3.3.13.5

Revise as follows:

3.3.13.5* *Passive Purge Sprinkler System.* A type of sprinkler system that serves one or more toilets in addition to the fire sprinklers.

Section 4.4

Revise as follows:

4.4* Documentation. Documentation shall be provided to demonstrate that the water supply, listed devices, and sprinkler coverage comply with the requirements of this standard. 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 or developer.
2. Location, including street address or lot number.
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.
9. Location of Static and residual hydrants that were used in flow tests shall be shown.
10. If required, the location of the domestic GPM demand indicated.
11. Make, type, model, temperature rating, nominal K-factor, and number of each type of sprinkler, including sprinkler identification number.

12. Pipe type and schedule of wall thickness.
13. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions).
14. Location and size of riser nipples and drops.
15. Type of fittings and joints.
16. Type and locations of hangers, and methods of securing sprinklers when applicable.
17. Location and size of all valves and drainpipes.
18. Location and size of water gauges.
19. 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.
20. A summary of the hydraulics, including the static pressure, residual pressure, and flow of the water supply, safety margin, 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.
21. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
22. Relative elevations of sprinklers, junction points, and supply or reference points.
23. A graphic representation of the scale used on all plans.
24. Name, address, phone number, and contractor's license number of contractor.
25. Nevada State Fire Marshal registration number.
26. Signature and NICET number, or engineer's seal, of the designer.
27. Indicate by note the minimum rate of water application per sprinkler head, the maximum spacing for each head, and the domestic demand.
28. 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.
29. General notes or tables as required by the AHJ.
30. Edition year of NFPA 13D to which the sprinkler system is designed.
31. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

Section 6.2.3.1

Revise as follows:

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

Section 6.3.1.1

Revise as follows:

6.3.1.1 Passive purge sprinkler systems shall meet the requirements of Section 7.8.

Section 6.3.1.2

Revise as follows:

6.3.1.2 Network sprinkler systems shall meet the requirements of Section 7.9.

Section 6.5.3

Revise as follows:

6.5.3 The installation of a water treatment and filtration loop shall be in accordance with Section 7.8.4 or 7.9.2,

Section 7.1.1

Revise as follows:

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

Section 7.1.2

Revise as follows:

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

Section 7.5.6.2

Revise as follows:

7.5.6.2 Sprinklers stored or installed where maximum ambient temperatures exceed 100° F (38° C) shall be intermediate temperature-rated sprinklers unless modified by 7.5.6.3.

Section 7.8

Revise as follows:

7.8 Passive Purge Sprinkler Systems. Passive purge sprinkler systems shall supply a minimum of one toilet fixture. Passive purge sprinkler systems shall meet the requirements of Sections 7.8.1 through 7.8.5.

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

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

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

7.8.4 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.

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

Section 7.9

Revise as follows:

7.9 Network Sprinkler Systems. Network sprinkler systems shall provide supply for all interior domestic fixtures and fire sprinkler needs. Network sprinkler systems shall meet the requirements of sections 7.9.1 through 7.9.4.

7.9.1 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.

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

(1) The flow restriction and pressure loss through the water treatment equipment shall be taken into account in the hydraulic calculations.

(2) An automatic bypass shall be installed around the water treatment equipment that directs all water directly to the system.

7.9.3 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.

7.9.4 Where required by the authority having jurisdiction, network sprinkler 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.

Section 8.1.3.1.2

Revise 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.

Section 8.3.4

Revise as follows:

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

Exception: Detached garages that have *habitable space* (as defined in the IRC) shall require sprinklers.

Section 8.3.11

Revise as follows:

8.3.11.1 Sprinkler protection shall be provided under open stairwells greater than 4 ft wide.

8.3.11.2 Sprinklers shall be installed under each landing of open stairwells.

8.3.11.3 Stair risers shall not be considered an obstruction to sprinkler discharge. Sprinklers shall not be required underneath stair risers provided the floor area protection of stair risers are within the landing(s) sprinkler(s) design coverage area.

Section 8.4

Revise as follows:

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 upgraded or installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 8.4.1 shall be applied.

Table 8.4.1 Protection Matrix for Group R Division 3 Occupancies and Buildings Built Under the IRC[4]

Fire Lane Distance per IFC 503.1.1	Building Area SIZE RANGE[5]	Mitigation Residential SYSTEM TYPE[1,3]	MINIMUM WATER METER SIZE[6]	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING
≤350 FT	≤10,000 SQ. FT.	Enhanced NFPA 13D[1,2]	3/4"/1"[7]	No
≤350 FT	>10,000 SQ. FT.	Enhanced NFPA 13D 4 hd calculation[1,2,8]	1"	No
>350 FT	Any Size	Enhanced NFPA 13D 4 hd calculation[1,2,8]	1"	No

1. This mitigation constitutes a building “protected with an approved fire sprinkler system” per the IFC.
2. Domestic demand of 5gpm is required to be added to the sprinkler demand in the hydraulic calculations.
3. Free-standing detached buildings with *habitable space* (as defined in the IRC) shall be protected by a minimum Enhanced NFPA 13D system.
4. Excluding Group Care Homes with two or less persons being cared for per NRS 449.1865.
5. Building area is defined as the areas under roof except for porches, patios, balconies, carports, and porte cocheres.
6. Water meters used for residential sprinkler systems shall be residential fire service meters or other meters approved by the water purveyor.
7. Minimum 1” water meters shall be installed in the City of Henderson.
8. Enhanced 13D 4-head calculation design requires the hydraulic design area to include all sprinklers within a compartment, up to a maximum of four sprinklers.

8.4.2 Where required. When Table 8.4.1 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.

Section 10.1.2

Revise as follows:

10.1.2 Water Supply. A copy of the water supply report shall be submitted with the permit package to support the hydraulic calculations. When water purveyors have the ability to provide a water model proving the available water supply, water model reports shall be provided in lieu of fire hydrant flow tests. Where the system is located outside the municipal system a traditional flow test must be permitted, performed, and recorded with the AHJ. When approved by the AHJ, other means to quantify the water supply may be accepted.

Section 10.4.6.1

Revise as follows:

10.4.6.1 A copy of the water supply report shall be submitted with the permit package to support the hydraulic calculations. When water purveyors have the ability to provide a water model proving the available water supply, water model reports shall be provided in lieu of fire hydrant flow tests. Where the system is located outside the municipal system a traditional flow test must be permitted, performed, and recorded with the AHJ. When approved by the AHJ, other means to quantify the water supply may be accepted.

Section 10.4.7.1

Revise as follows:

10.4.7.1 A copy of the water supply report shall be submitted with the permit package to support the hydraulic calculations. When water purveyors have the ability to provide a water model proving the available water supply, water model reports shall be provided in lieu of fire hydrant flow tests. Where the system is located outside the municipal system a traditional flow test must be permitted, performed, and recorded with the AHJ. When approved by the AHJ, other means to quantify the water supply may be accepted.

Section 12.1

Revise as follows:

12.1* General. 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

Section 1.1

Revise 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 complying with all of the following:

(1) Two stories or less above grade plane.

(2) For other than Group R-2 occupancies, the floor level of the highest story is 30 feet (9144 mm) or less above the lowest level of fire department vehicle access. For Group R-2 occupancies, the roof assembly is less than 45 feet (13 716 mm) above the lowest level of fire department vehicle access. The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance.

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

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

Residential occupancies not in compliance with this section shall be protected throughout in accordance with NFPA 13.

Section 6.4.4

Revise 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.

Section 6.6.4

Revise as follows:

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

Section 6.6.7

Revise as follows:

6.6.7 Sprinklers shall not be required in closets (regardless of size) on exterior balconies if all of the following conditions are met:

(1) The closet does not have doors leading directly into the dwelling unit.

(2) The closet does not have unprotected penetrations directly into the dwelling unit.

(3) The balcony is not used as a means of egress.

(4) The closet does not contain any fuel-fired equipment.

Section 6.8.2

Revise 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.

Section 6.15

Delete Section 6.15.

Section 8.1.7

Revise 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) Edition year of this standard to which the sprinkler system is designed

(2) Project name

(3) Location, including street address

(4) Name and address of the contractor

(5) Point of compass

(6) A graphic representation of the scale used on all plans

(7) 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

(8) Ceiling/roof heights and slopes not shown in the full height cross section

(9) Location of partitions, fire barriers, fire walls, draft curtains, and similar features as they relate to the sprinkler system. Including lintels and doorways, lintel openings require a cross-section view to indicate the area of the opening.

(10) Any small enclosures in which no sprinklers are to be installed

(11) Location and size of concealed spaces, attics, closets, and bathrooms

(12) Location of fuel-fired equipment and heating and air conditioning equipment

(13) Location of closets on exterior balconies, and any doors or penetration between the closet and the dwelling unit

(14) Area per floor

(15) Size of the city main in street and the city main test results, including elevation of the test hydrant

(16) Underground pipe size, length, location, weight, material, and point of connection to the city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade

(17) Size and location of hydrants, showing size and number of outlets, including any static and residual hydrants that were used in flow tests

(18) Size, location, and piping arrangement of fire department connections

(19) Information about backflow preventers (e.g., manufacture, size, type)

(20) Make, manufacturer, type, temperature rating, sprinkler identification number, and nominal K-factor of the sprinkler

(21) Type and location of high-temperature sprinklers

(22) Number of sprinklers on each riser, per floor

(23) Type of pipe and fittings

(24) Pipe type and schedule of wall thickness

(25) Nominal pipe size and lengths (lengths as they relate to hydraulic reference points)

(26) Location and size of riser nipples

(27) Type of fittings and joints and the location of all welds and bends

(28) All control valves, check valves, drainpipes, and test connections

(29) Information about antifreeze solution used (e.g., type and amount)

(30) Type and location of alarm bells

(31) Types and locations of hangers, sleeves, and braces, and methods of securing sprinklers, where applicable

(32) 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

(33) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.

(34) The minimum rate of water application and the design area of water application

(35) The total quantity of water and the pressure required noted at a common reference point for each system

(36) Relative elevations of sprinklers, junction points, and supply or reference points

(37) For hydraulically designed systems, the information on the hydraulic data nameplate, including safety margin

(38) Contractor's license number of sprinkler contractor

(39) Occupancy, label, and name for each area or room

(40) Make, type, model, and size of alarm or dry pipe valve, 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

Section 8.2.3

Revise as follows:

8.2.3 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.

NFPA 14

Section 7.9.7

Revise as follows:

7.9.7 Fire Department Connections shall be provided with internal check valve(s) such that water being supplied into any inlet will not flow back out of any other inlet. For the purpose of this section, internal clapper valve devices provided by the manufacturer in the listed Fire Department Connections shall be considered internal check valves. (*see Section 10.7 for design requirements)*

Section 9.5.2.2.1.1

Revise as follows:

9.5.2.2.1.1 The travel distance in 9.5.2.2.1 shall be limited to 100 ft (30480 mm) of hose and 30 ft (9144 mm) of stream from each hose valve connection for sprinklered buildings.

Section 9.5.2.2.1.2

Revise as follows:

9.5.2.2.1.2 The travel distance in 9.5.2.2.1 shall be limited to 100 ft (30480 mm) of hose and 30 ft (9144 mm) of stream from each hose valve connection for nonsprinklered buildings.

Section 9.5.2.4.1

Revise as follows:

9.5.2.4.1* Additional hose connections shall be provided in fully sprinklered buildings 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 ft (30480 mm) of hose and 30 ft (9144 mm) of stream from each hose valve connection.

Section 9.5.2.4.2

Revise as follows:

9.5.2.4.2* Additional hose connections shall be provided in buildings not meeting the requirements of 9.5.2.4.1 so that all floor areas of the floor or story are protected by hose valve coverage, with travel distance limited to 100 ft (30480 mm) of hose and 30 ft (9144 mm) of stream from each hose valve connection.

Section 9.5.2.4.3

Revise as follows:

9.5.2.4.3 In open parking garages, the distances shall be in accordance with 9.5.2.4.1 and 9.5.2.4.2.

Section 9.5.2.8.1

Revise as follows:

9.5.2.8.1 All portions of the helistop and heliport shall be within a maximum travel distance of 100 ft (30480 mm) of hose and 30 ft (9144 mm) of stream from each Class I hose connection.

Section 9.5.3

Revise as follows:

9.5.3 Class II Systems. Class II systems shall be provided with hose stations so that all portions of each floor level of the building are within a maximum travel distance of 100 (30480 mm) of hose and 30 ft (9144 mm) of stream to a hose connection provided with 1½ in. (40 mm) hose.

Section 9.5.5.1

Revise as follows:

9.5.5.1 Hose connections shall be located so that there is at least 3 in. (75 mm) clearance between any adjacent object 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 the outlet/cap from any adjacent object.

Section 9.6.2.1

Revise as follows:

9.6.2.1 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.

Section 9.6.8.1

Revise as follows:

9.6.8.1 Valves controlling water supplies shall be supervised in an approved manner in the open position by a central station, proprietary, or remote station signaling service.

Section 9.9.5.3.1

Revise as follows:

9.9.5.3.1 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.

Section 9.10.1.1.2

Revise as follows:

9.10.1.1.2 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.

Section 10.2.4.2

Revise as follows:

10.2.4.2* Where the static pressure at a 2½ in. (65 mm) hose connection exceeds 200 psi (13.8 bar), a listed pressure-regulating device shall be provided to limit static and residual pressures at the hose connection to no more than 200 psi (13.8 bar).

Section 10.2.4.4

Revise as follows:

10.2.4.4 Where hose valve pressure-regulating devices are installed on 2½ 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.

Section 10.2.5

Revise as follows:

10.2.5* Where more than two hose connections are used downstream of a pressure-regulating device, the following conditions shall apply:

(1) In systems with multiple zones, pressure-regulating device(s) shall be permitted to be used in lieu of providing separate pumps to control pressure in the lower zone(s) as long as the devices comply with all requirements in 10.2.5. For each pressure-regulating device provided, a secondary pressure-regulating device matching the primary device shall be provided in parallel configuration.

(2) A method to isolate each of the pressure-regulating device(s) shall be provided for maintenance and repair by providing control valves on the supply and discharge side of each pressure-regulating device, in a manner where only the device being maintained and repaired is out of service.

(3) To provide redundancy, pressure-regulating devices shall be arranged in parallel so that the failure of any single device does not allow pressure in excess of 200 psi (13.9 bar) to any of the multiple hose connections downstream.

(4) An equally sized bypass around the pressure-regulating device(s), with a normally closed valve, shall be installed.

(5) Pressure-regulating device(s) and the bypass valve shall be installed not more than 7 ft 6 in (2.3 m) above the floor.

(6) The pressure-regulating device shall be provided with inlet and outlet pressure gauges.

(7) The fire department connection(s) shall be connected between the system fire pump(s) and the pressure-regulating device(s) and shall be sized and designed to allow the fire department connection to match the pressure and flow from the fire pump.

(8) The pressure-regulating device shall be provided with a pressure relief valve sized for the full anticipated system flow and capable of maintaining downstream system pressures below the maximum pressure ratings for all system components.

(9) Remote monitoring and supervision for detecting high pressure failure of the pressure-regulating device shall be provided in accordance with *NFPA 72*.

(10) A drain sufficient to allow flow of the full anticipated system flow shall be provided adjacent to the pressure-regulating devices. Use of this drain line for discharge from the pressure relief valve shall be permitted.

(11) A permanent sign shall be provided at the pressure-regulating device to indicate what the valve needs to be set at for proper system operation.

Section 10.2.6.1

Revise as follows:

10.2.6.1 Minimum Design Pressure for Hydraulically Designed Systems. Hydraulically designed standpipe systems shall be designed to provide the waterflow rate required by Section 10.6 at a minimum residual pressure of 125 psi (8.6 bar) at the outlet of the hydraulically most remote 2½ in. (65 mm) hose connection and 65 psi (4.5 bar) at the outlet of the hydraulically most remote 1½ in. (40 mm) hose connection.

Section 10.2.6.1.2

Revise as follows:

10.2.6.1.2* Manual standpipe systems shall be designed to provide 125 psi (8.6 bar) at the outlet of the hydraulically most remote 2½ in. (65 mm) hose connection valve with the calculations terminating at the fire department connection (FDC) or FDCs where multiple connections are provided.

Section 11.1.2

Revise as follows:

11.1.2 Working plans shall be drawn to an indicated scale, on sheets of uniform size, and shall show sufficient information to demonstrate code-compliant design, including, at minimum, those items from the following list that pertain to the design of the system:

(1) Name of owner(s) or owner’s (owners’) representative

(2) Location, including street address

(3) Point of compass

(4) Name, address, phone number, and contractor’s license number of installing contractor

(5) For automatic and semiautomatic standpipe systems, the following:

(a) Layout of underground mains between the in-building riser and the location(s) of sources of supply including pipe sizes, lengths, material, and weights (pressure class or dimension ratio).

(b) Locations and types of meters, backflow prevention devices, valves, and valve pits.

(6) For automatic and semiautomatic standpipe systems, other sources of supply, with pressure and elevation

(7) For automatic dry and semiautomatic dry standpipe systems, approximate capacity of each dry pipe system

(8) For automatic and semiautomatic standpipe systems, water supply capacity information, including the following:

(a) Location and elevation of static and residual test gauge with relation to the riser reference point

(b) Flow location

(c) Static pressure [psi (bar)]

(d) Residual pressure [psi (bar)]

(e) Flow [gpm (L/min)]

(f) Date the test was conducted

(g) Time the test was conducted

(h) Name of person who conducted the test or supplied the information

(i) Other sources of water supply, with pressure or elevation

(9) Pipe type and schedule of wall thickness

(10) Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions)

(11) Type of fittings and joints and locations of all welds and bends

(12) Type and location of hangers, sleeves, braces, methods of securing piping, and seismic calculations

(13) All control valves, check valves, drain pipes, and test connections

(14) Make, type, model, and size of alarm, dry pipe, or deluge valve

(15) Type and location of alarms

(16) Size and location of standpipes, hose connections, hand hose, nozzles, cabinets, and related equipment with details from the manufacturer including model numbers and sizes

(17) Information on the hydraulic data nameplate

(18) Hydraulic reference points shown on plan including the top view, section view, and isometric view, that correspond with comparable reference points on the hydraulic calculation sheets

(19) The setting for pressure-regulating devices including direct-acting and pilot-operated valves, and provide a detail for each unique installation configuration

(20) The size and location of hydrant(s) in relation to FDCs

(21) Size, location, and piping arrangement of FDCs

(22) Scale and graphical representation of the scale

(23) Hose valve manufacturer and model

(24) Pressure-reducing valve(s) manufacturer and model

(25) Required pressure at hose valve outlet

(26) Location of hose valves used in the hydraulic calculations

(27) Standpipe system demand (flow and pressure) at the following locations:

- (a) FDC inlet
- (b) Fire pump discharge flange
- (c) Water supply tank discharge
- (d) Water supply source if different from (a) through (c)

(28)* Legend defining all symbols used on the working plans

(29) Provide a detailed narrative describing the scope of work and the following items:

- (a) Standpipe system type and class
- (b) Minimum and maximum pressure requirements
- (c) The type of freeze protection, if applicable
- (d) The total quantity of hose valves being installed
- (e) The pressure required for the hydrostatic test, being 200psi or the pressure that is 50psi above pump churn pressure, whichever is higher.

(30) Nevada State Fire Marshal registration number

(31) Signature and NICET number, or engineer’s seal, of the designer

(32) General notes as required by the AHJ

(33) Provide an isometric view showing the entire system in one view including hydraulic reference points

(34) Full height cross section with ceiling construction

(35) Locations of fire walls, fire partitions, horizontal exits, and exit passageways

(36) Label and name of each area or room

(37) Where remote FDC’s are implemented, underground piping and valve information as applicable from item #5

(38) Provide information regarding the fire pump, as applicable

(39) Provide a detail of each required sign

(40) Plan view shall show, at minimum, supply and drain pipe layout, pipe dimensions, attachments, braces, hangers, standpipe hose outlets, hydraulic nodes, and the coverage area from each hose valve to the remote areas of the floor plan.

(a) Coverage areas of hose valves shown as hose lay on the floor plan to remote areas where hose lay is limited to 100’ and spray is limited to 30’. Hose lay shall be shown as the normal path of travel along the floor observing walls, doors, permanent obstructions such as millwork, cubicles, machinery, etc. Hose spray shall not turn nor bend

(41) Provide a detail of Class I, Class II, or Class III hose valves located in cabinets. Dimensions shall be provided to show that the cabinet size and the placement of items within the cabinet meet the requirements of Sections 7.6.1 and 9.5.5.1

(42) Where 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

(43) Provide details for penetrations of standpipe piping through walls, floors, and other structural members. Show detail to note clearances around the piping and/or locations of flexible connections

(44) Provide details for penetrations in rated walls and floors, providing information regarding the method of maintaining fire rating of the wall or floor

(45) Where direct-acting pressure-regulating hose valves are provided anywhere in the building, provide a chart on the plans. The chart shall have eight columns, as follows:

(a) Floor Level – Provide numerical designation for all floor levels in the building

(b) Static Pressure, Inlet – Indicate the static pressure at the inlet of each hose valve on all floor levels. Provide a supporting hydraulic calculation at zero flow with churn pressure, providing a node at the hose valve on each floor level to indicate the static pressure at each hose valve

(c) Residual Pressure, Full Flow, Inlet – Indicate the residual pressure at the inlet of each hose valve on all floor levels. Provide a supporting hydraulic calculation at full standpipe design flow per NFPA 14 (750 or 1000gpm), providing a node at each hose valve to indicate the residual pressure at each hose valve inlet

(d) Residual Pressure, 250-gpm flow, Inlet – Indicate the residual pressure at the inlet of hose valves on each floor while flowing 250gpm. Provide a supporting hydraulic calculation at 250gpm flow at the most remote standpipe outlet, providing a node on each floor level of the most remote standpipe to indicate the residual pressure at each hose valve

(e) Valve Make and Model – Indicate the manufacturer of the valve on all floors, and the model number for the specific valve. Provide supporting manufacturer specifications

(f) Valve Setting – Indicate the hose valve setting or bonnet number proposed for each valve. The setting or bonnet number must be associated with the manufacturer specifications for the valve

(g) Residual Pressure, Full Flow, Outlet – Indicate the residual outlet pressure at the outlet of the hose valve under the full-flow condition. For PRV installations, the residual pressure is taken from the pressure relation charts provided by the

manufacturer. For non-PRV installations, the residual pressure is taken by analysis of the equivalent lengths of the fittings and the hose valve

(h) Residual Pressure, 250-gpm flow, Outlet – Indicate the residual outlet pressure at the outlet of the hose valve when flowing 250gpm. This is necessary to establish the residual pressure expected during field inspection. For PRV installations, the residual pressure is taken from the pressure relation charts provided by the manufacturer

(46) Edition year of NFPA 14 to which the standpipe system is designed

(47) Other items required by AHJ

NFPA 20

Section 4.12.1.1

Revise 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.

Section 4.12.2.1

Revise 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.

Section 4.16.4.1

Revise as follows:

4.16.4.1 All pumps supplied by municipal water supply shall be installed with a bypass. (*See Figure A.4.16.4.*)

Section 4.22.1.1.1

Revise as follows:

4.22.1.1.1 All fire pumps shall be installed with a metering device.

Section 9.3.4

Revise as follows:

9.3.4 Where provided, the alternate source of power shall be supplied from one of the following sources:

(1) A generator installed in accordance with Section 9.6.

(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 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.

Section 10.2.1

Revise 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.

Section 10.4.7.1.1

Revise as follows:

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 per 10.4.7.2, shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

Section 11.3.2.3.3

Revise as follows:

11.3.2.3.3 Motor-operated dampers shall be installed in the air supply path. Such dampers shall be spring operated to the open position and motor closed. Motor-operated dampers shall be signaled to open when or before the engine begins cranking to start.

Exception: Open-air vents shall be permitted when complying with 11.3.2.3.2 and as approved by the building department or as approved by the AHJ.

Sections 11.3.2.4.4 – 11.3.2.4.4.2

Revise as follows:

11.3.2.4.4 Heat Exchanger-Cooled Engines.

11.3.2.4.4.1 For heat exchanger-cooled engines, motor-operated dampers shall be installed in the air discharge path. Such dampers shall be spring operated to the open position and

motor closed. Motor-operated dampers shall be signaled to open when or before the engine begins cranking to start.

Exception: Open-air vents shall be permitted when complying with 11.3.2.4.4.2 and as approved by the building department or as approved by the AHJ.

11.3.2.4.4.2 The air discharge path for heat-exchanger-cooled engines shall not restrict the flow of air more than 0.3 in. water column (7.6 mm water column).

Section 12.2.1

Revise as follows:

12.2.1* Controllers shall be located as close as is practical to the engines they control and shall be within sight of the engines. Controllers shall be readily accessible and have clear access to the entrance to the room.

Section 12.4.2.1.1

Revise as follows:

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 per 12.4.2.3, shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

NFPA 22

Section 4.2.1.4.1

Revise as follows:

4.2.1.4.1 When approved by the AHJ, alternative water sources provided in accordance with 4.2.1.2 or manual refilling in accordance with 14.4.1.1 shall be capable of filling the minimum required fire protection volume of the tank within a time acceptable to the AHJ.

Sections 14.5.2.2 – 14.5.2.2.3

Revise as follows:

14.5.2.2 If the break tank is sized to provide a minimum duration of 30 minutes of the maximum system demand, the refill mechanism shall meet the requirements in 14.5.2.2.1 through 14.5.2.2.3.

14.5.2.2.1 The refill mechanism shall be designed for and capable of refilling the tank at a minimum rate of 150 percent of the fire pump(s) capacity.

14.5.2.2.2 A manual tank fill bypass shall be designed for and capable of refilling the tank at a minimum rate of 150 percent of the fire pump(s) capacity.

14.5.2.2.3 If available supplies do not permit refilling the tank at a minimum rate of 150 percent of the rated pump capacity, the refill mechanism and manual fill bypass shall be capable of refilling the tank at a rate that meets or exceeds 110 percent of the maximum fire protection system design flow.

Section 14.6.1.1

Revise as follows:

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.

Section 14.9.1.1

Revise as follows:

14.9.1.1 Where the water storage tank acts as a break tank between the city supply and the 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 (127mm) 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 operate the fill control bypass valve.

NFPA 24

Section 6.6.1

Revise as follows:

6.6.1* Sectional valves shall be provided on looped systems at locations within piping sections such that the number of fire protection connections between sectional valves does not exceed two.

Section 6.6.2

Revise as follows:

6.6.2 A sectional valve shall be provided at the following locations:

(1) On each bank of a river, pond, or lake where a main crosses water

(2) Outside the building foundation(s) where a main or a section of a main is installed under a building

(3) On the underground line where there are two sources of water, after every 2 fire hydrants or building fire sprinkler connections

NFPA 55

Section 13.4.1.2

Revise as follows:

13.4.1.2 Vent Pipe Systems. Pressure relief devices shall be piped to the outdoors where the discharge will not impinge on the structure, personnel, or means of egress and will not create a hazardous concentration of carbon dioxide. The termination point of pressure relief vent discharge piping shall be outdoors and a minimum of 10 feet from operable openings into the building.

NFPA 72

Section 7.2.1

Revise as follows:

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

(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 environment 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) For software-based systems, a copy of site-specific software, including specific instructions on how to obtain the means of system and software access (password)

(15) Record (as-built) drawings

(16) Records, record retention, and record maintenance in accordance with Section 7.7

(17) Completed record of inspection and testing in accordance with 7.6.6 and 7.8.2

(18) 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

(19) AHJ notes

(20) Addressable device list with descriptions or conventional zone list with descriptions

Section 10.4.4

Revise 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 40 in. (1018 mm) above the finished floor. This does not apply to Remote Power Supply (RPS) panels.

Section 10.4.5.1

Revise as follows:

10.4.5.1* Smoke or heat detector(s) shall not installed at the location of dedicated function(s) fire alarm control unit(s).

Section 12.2.3

Revise as follows:

12.2.3 The installation of all pathway wiring, cable, and equipment shall be in accordance with *NFPA 70* 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. Residential two stories or less occupancies shall still be provided protection in accordance with NFPA 70 Section 760.53 (A)(2) where cable passes through a floor or wall (7 ft) above the floor.

Sections 18.3.7.3 – 18.3.7.5

Revise as follows:

18.3.7.3 Voltage drop calculations shall be provided for new installations and existing circuits where circuit modifications include the addition of new appliances, any increase in existing appliance current draws, or where a circuit is extended by more than ten (10) feet.

18.3.7.3.1 Unless otherwise specified by manufacturer's documentation, starting voltage (V_S) shall be 20.4VDC and end of line voltage (V_{EOL}) shall be a minimum of 16VDC. The calculated voltage drop (V_D) shall comply with either 18.3.7.3.3 or 18.3.7.3.4.

$$V_{EOL} = V_S - V_D \qquad [18.3.7.3.1]$$

$V_{EOL} = \text{Voltage at End of Line (volts)}$
$V_S = \text{Starting Voltage (volts)}$
$V_D = \text{Calculated Voltage Drop (volts)}$

18.3.7.3.1.1 For addressable notification appliances listed to nominal 29VDC, starting voltage shall be 85% of the battery power supply voltage, and the minimum voltage at the appliance shall be 23VDC. The calculated voltage drop (V_D) shall comply with either 18.3.7.3.3, 18.3.7.3.4, or manufacturer calculation instructions.

18.3.7.3.2 Where a modified circuit contains existing appliances with no published UL Max current draws the maximum voltage drop (V_D) shall not exceed two (2) volts.

18.3.7.3.3 End Line Loading (ELL) Method. The calculated voltage drop using the End Line Loading Method shall be determined from either equation 18.3.7.3.3a or 18.3.7.3.3b. Wire Resistance (R) & Conductor Area (CM) shall be taken from Table 18.3.7.3.3a. Specific Resistance (K) shall be taken from Table 18.3.7.3.3b. Appliance current draws (I) shall be the manufacturer's published UL Max current draws.

[18.3.7.3.3a]

$$V_D = \frac{2 * R * I_T * L_T}{1000}$$

$$V_D = \frac{2 * K * I_T * L_T}{CM} \quad [18.3.7.3.3b]$$

Where:
V_D = Calculated voltage drop (volts)
R = Wire resistance (ohms/kFt)
I_T = Total amperage load of circuit (amps)
L_T = Total circuit length between panel and end of line (ft)
K = Specific resistance (ohm − cmil/ft)
CM = Conductor area (cmil)

Table 18.3.7.3.3a

Copper Wire Properties		
Wire Size	R, 1-Strand / 7-Strand (ohms/kFt at 75C)	CM, Conductor area (cmil)
12 AWG	1.93 / 1.98	6530
14 AWG	3.07 / 3.14	4110
16 AWG	4.89 / 4.99	2580
18 AWG	7.77 / 7.95	1620

Table 18.3.7.3.3b

Copper Resistance	
K, Specific Resistance (ohm-cmil/ft at 75C)	12.90

18.3.7.3.4 Point to Point (PTP) Method. The calculated voltage drop using the Point to Point Method shall be determined from equations 18.3.7.3.4a and either 18.3.7.3.4b or 18.3.7.3.4c. Wire Resistance (R) & Conductor Area (CM) shall be taken from Table 18.3.7.3.3a. Specific Resistance (K) shall be taken from Table 18.3.7.3.3b. Notification appliance current draws (I) shall be the manufacturer's published UL Max current draws.

$$V_D = V_{D_1} + V_{D_2} + V_{D_3} + \cdots + V_{D_n} \quad [18.3.7.3.4a]$$

A voltage drop is calculated between each appliance along the circuit. There are “n” appliances on a circuit.

$$V_{D_i} = \frac{2 * R * I_P * L_P}{1000} \quad [18.3.7.3.4b]$$

$$V_{D_i} = \frac{2 * K * I_P * L_P}{CM} \quad [18.3.7.3.4c]$$

Where:
V_D = Sum of calculated voltage drops (volts)
V_{D_i} = Calculated voltage drop between the previous appliance[1] and the current appliance (volts)
R = Wire resistance (ohms/kFt)

I_P = Sum of all current draws from the current appliance to the end of line appliance (amps)
L_P = Length of wire between the previous appliance[1] and the current appliance(ft)
K = Speific resistance (ohm − cmil/ft)
CM = Conductor area (cmil)
Note #1 where the current appliance is the first appliance on the circuit, the "previous appliance" is the panel.

18.3.7.4 Audio Notification Appliance Circuits. Power loss calculations shall be provided for new installations and for existing circuits where circuit modifications increase the power (watts) demand or where a circuit is extended by more than ten (10) feet.

18.3.7.4.1 Power loss shall be determined from either equation 18.3.7.4.1a or 18.3.7.4.1b and shall be limited to a 0.5dB loss. Wire Resistance (R) & Conductor Area (CM) shall be taken from Table 18.3.7.3.3a. Specific Resistance (K) shall be taken from Table 18.3.7.3.3b.

$$P_{Loss} = 20 * \log\left[\frac{\frac{V^2}{P}}{\frac{V^2}{P} + \frac{2 * R * L}{1000}}\right] \quad [18.3.7.4.1a]$$

$$P_{Loss} = 20 * \log\left[\frac{\frac{V^2}{P}}{\frac{V^2}{P} + \frac{2 * K * L}{CM}}\right] \quad [18.3.7.4.1b]$$

Where:
P_{Loss} = Power loss (dB)
V = Amplifier voltage (volts)
P = Total wattage draw on circuit (watts)
R = Wire resistance (ohms/kFt)
L = Circuit length bewteen panel and end of line (ft)
K = Specific resistance (ohm − cmil/ft)
CM = Conductor area (cmil)

18.3.7.5 Where notification appliance circuits are calculated, plans shall show to an indicated scale the entirety of each circuit including all appliance locations and settings, even for existing circuits where any portion of the circuit is outside of the proposed work area.

Section 18.4.2.5

Revise as follows:

18.4.2.5* 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.

Section 18.5.5.7.2

Revise as follows:

18.5.5.7.2 Visual notification appliances shall be installed in accordance with Table 18.5.5.7.1(a) or Table 18.5.5.7.1(b) using one of the following:

(1) A single visual notification appliance.

(2)* Two groups of visual notification appliances, where visual notification appliances of each group are synchronized, in the same room or adjacent space within the field of view. This shall include synchronization of visual appliances operated by separate systems.

(3) More than two visual 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 edition of NFPA 72.

Section 18.5.5.9.2.1

Revise as follows:

18.5.5.9.2.1 Documentation provided to the authority having jurisdiction shall be stamped by a Nevada licensed engineer or prepared by a NICET Level IV fire alarm designer and shall include the inverse square law calculations using each of the vertical and horizontal polar distribution angles in UL 1638, *Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories*, or equivalent.

Section 18.5.5.11

Revise as follows:

18.5.5.11 Ceiling-mounted visual notification 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 appliances may become obstructed.

Section 21.7.9

Revise as follows:

21.7.9 Where duct detectors are installed in accordance with Uniform Mechanical Code Section 609.1, automatic shut-off shall be accomplished by interrupting the power source or utilizing the stop input, if provided on the air moving equipment.

Section 23.2.2.4

Revise as follows:

23.2.2.4 A permit is required prior to making any changes, except room label changes.

Section 23.8.5.1.3

Revise as follows:

23.8.5.1.3 A pull station in accordance with 23.8.5.1.2 shall not be installed in *Dedicated Function Fire Alarm Systems*.

Section 23.8.5.9.1

Revise as follows:

23.8.5.9.1 Where fire pumps are required to be monitored and a building fire alarm system is installed, a pump running signal shall be a supervisory signal.

Section 23.8.5.9.3

Revise as follows:

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*.

Section 23.8.5.9.4

Revise 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 2022 NFPA 20 Section 10.4.7 2 (electric pumps) and 2022 Section NFPA 20 12.4.2.3 (diesel pumps).

Section 23.8.6.3.2

Revise as follows:

23.8.6.3.2 The boundaries of fire alarm notification zones shall be coincident with building outer walls, fire walls, fire barriers, or other 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.

Section 24.4.9.4

Revise as follows:

24.4.9.4 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or other 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.

Section 24.9

Revise as follows:

24.9* Two-Way Radio Communications Enhancement Systems. All in-building two-way radio communications enhancement systems shall be designed, installed, and maintained in accordance with NFPA 1225 and the Fire Protection Association of Nevada guide for Emergency Responder Communications Enhancement Systems Permitting, Testing, & Recertification.

Section 24.10.13.3

Revise as follows:

24.10.13.3 Signage including all required information shall be durable and permanently affixed in a manner acceptable to the fire code official. Temporary signs, stickers, or easily removable labels shall not be utilized.

NFPA 1225

Section 18.12.3

Revise as follows:

18.12.3.3 Backbone cables and backbone cable components installed in buildings that are fully protected by an automatic sprinkler system in accordance with NFPA 13 shall comply with 18.12.3.4.

18.12.3.4* Backbone cables and backbone cable components installed in buildings shall be protected from attack by fire in accordance with one of the following:

(1) Use a cable with a listed fire-resistance rating in accordance with the following:

(1) Where the primary structural frame of a building is required to have a fire-resistance rating of 2 hours or more or is classified as heavy timber construction, the minimum fire-resistance rating shall be 2 hours.

(2) Where the primary structural frame of a building is required to have fire-resistance rating of less than 2 hours, the minimum fire-resistance rating shall be 1 hour.

(3) Where the primary structural frame of a building does not require a fire-resistance rating, a fire resistance rating shall not be required.

(2) A protected enclosure or area shall have a fire-resistance rating in accordance with the following:

(a) Where the primary structural frame of a building is required to have a fire-resistance rating of 2 hours or more or is classified as heavy timber construction, the minimum fire-resistance rating shall be 2 hours.

(b) Where the primary structural frame of a building is required to have a fire-resistance rating of less than 2 hours, the minimum fire resistance rating shall be 1 hour.

(c) Where the primary structural frame of a building does not require a fire-resistance rating, a fire resistance rating shall not be required.

NFPA 2001

Section 9.1.1.6

Revise as follows:

9.1.1.6 Releasing control panels shall be addressable type. 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).

Exception: Conventional type releasing panels utilizing no more than ten (10) non-addressable automatic initiating devices may be utilized when approved by the authority having jurisdiction.

Section 9.5.6

Revise as follows:

9.5.6 Appliances used for occupant notification shall be labeled “AGENT” or be otherwise differentiated from building fire alarm and sprinkler notification appliances by other means approved by the authority having jurisdiction. Where visual notification is provided, agent strobes shall be provided with blue colored lenses unless otherwise approved by the authority having jurisdiction.