Southern Nevada Fire Code Amendments

Southern Nevada Fire Code Committee

Clark County – Henderson - Las Vegas – North Las Vegas

June 13, 2013

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International Fire Code

101.2.1

101.2.1 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

The following appendices are hereby adopted and are a part of this code:

Appendix B – Fire-flow requirements for buildings, as amended

Appendix C – Fire hydrant locations and distribution, as amended

Appendix H – Hazardous materials management plan (HMMP) and hazardous materials inventory statement (HMIS) instructions

Appendix K – Proprietary(self) monitoring, as amended

Appendix L- Impairment Procedures, as amended

Justification: The purpose of this amendment is to identify the titles of the appendices that are adopted as a part of the fire code.

102.7.3

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.

IBC-12 2012 International Building Code

IMC-12 International Mechanical Code is replaced with 2012 Uniform Mechanical Code

IPC-12 International Plumbing Code is replaced with 2012 Uniform Plumbing Code

IRC-12 2012 International Residential Code

Justification: To reference the codes adopted by the respective local jurisdiction.

105.1.4

105.1.4 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.

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

The following information shall be provided on the certificate:

1. The contractor shall be named as the insured. If the insurance is provided by an individual, company or partnership other than the contractor, the contractor shall be named as an additional insured.
2. "*insert name of jurisdiction* it's agents, employees and volunteers" shall be named as both an additional insured and certificate holder
3. General liability limits, including contractual liability, in the minimum amounts specified below of the specific operation being conducted:
    a. To erect temporary membrane structures, tents, or canopies. See Chapter 31 $2,000,000.
    b. To store or use explosive materials or pyrotechnic displays. See Chapter 56: $2,000,000

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

    c. To operate a special amusement building. See Chapter 9. $2,000,000.

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

Justification: This section consolidates the requirements for certificates of insurance into one location. In Southern Nevada the local governments have used certificates of insurance in lieu of surety bonds or other financial devices. Certain activities carry a higher degree of risk and for these activities the code stipulates the minimum amount of insurance coverage that must be provided.

105.3.1

105.3.1 Expiration. An operational permit shall remain in effect until reissued, renewed, or revoked or for such a period of time as specified in the permit, not exceeding one year from date of issuance. Construction permits shall automatically become invalid unless the work authorized by such permit is commenced within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. Before such work recommences, a new permit shall be first obtained and the fee to recommence work, if any, shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided

further that such suspension or abandonment has not exceeded one year. Permits are not transferable and any changes in occupancy, operation, tenancy or ownership shall require a new permit to be issued.

Justification: The purpose of this amendment is to specify the maximum duration of operational permits. Lesser durations required elsewhere in the code, such as 180 days for temporary membrane structures, still apply as more restrictive requirements.

105.6.2

105.6.2 Amusement buildings. An operational permit is required to operate both permanent and temporary ~~a~~ special amusement buildings. Permanent special amusement building permits shall have duration in accordance with Section 105.3.1. Temporary special amusement buildings permits shall have a duration of 60 days or less.

Justification: This change limits the use of temporary amusement buildings to 60 days, which is consensus for the valley

Table 105.6.8

TYPE OF GAS	AMOUNT (cubic feet at NPT)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any amount
Toxic	Any amount
Liquefied carbon dioxide	874 (100 lbs)

Justification: This change is in recognition of standard industry practices and more accurately reflects a quantity that can present an inhalation hazard.

105.6.23

105.6.23 Hot work operations. An operational permit is required for hot work including, but not limited to:

1. Public exhibitions and demonstrations where hot work is conducted.
2. Use of portable hot work equipment inside, upon, or within 10 feet of a structure.

   Exception: Work that is conducted under a construction permit.
3. Fixed-site hot work equipment such as welding booths.
4. Hot work conducted within a hazardous fire area.
5. Application of roof coverings with the use of an open-flame device.
6. When approved, the *fire code official* shall issue a permit to carry out a Hot Work Program. This program allows approved personnel to regulate their facility's hot work operations. The approved personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in Chapter 35. These permits shall be issued only to their employees or hot work operations under their supervision.

Justification: Added language is provided to clarify that use of portable hot works equipment around buildings requires an operational permit prior to commencement of work.

105.6.27

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

1. Storage and use of LP-gas

Exceptions:

1. An operational permit is not required ~~for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies~~ in Group R-3 occupancies and buildings constructed in accordance with the IRC.
2. An operational permit is not required for individual containers with a 30-gallon (113.6 L) water capacity or less or multiple containers having an aggregate quantity not exceeding 30 gallons (113.6 L).

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

Justification: This amendment makes all Group R-3 occupancies exempt from an LP-gas operational permit. For all other occupancies it establishes a 30-gallon threshold for operational permits thereby exempting a single BBQ propane tank from needing a permit.

105.6.32

105.6.32 Open flames and candles. An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurant or drinking establishments. Annual permits for open flames and candles that are periodically used at facilities are acceptable where the permit application provides all conditions surrounding the use of the particular open flames or candles. This annual permit allows a facility to use preapproved open flames and candles repeatedly throughout the year.

Justification: This change clarifies how annual permits for open flames and candles may be approved.

105.6.40

105.6.40 ~~Rooftop~~ Heliports, Helistops, and Emergency Landing Pads. An operational permit is required for the operation of a ~~rooftop~~ heliport, helistop, and/or emergency landing pad. See Chapter 20 and NFPA 418

Justification: In Southern Nevada, the use of helicopters to transport celebrities and other VIP's on a regular basis justifies the need for an inspection of heliports, etc.

105.6.47 thru 105.6.61

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

105.6.48 Filming. An operational permit is required to film, or broadcast at a public studio, production location, or sound stage. See Section 322.

105.6.49 Fire Pumps. An operational permit is required for facilities that contain a fire pump. See Chapter 9 and NFPA 20

105.6.50 Fire Suppression and Extinguishing Systems. An operational permit is required for facilities that contain a fire suppression or extinguishing system. See Chapter 9

105.6.51 Firewood. An operational permit is required to store firewood in excess of 50 cords. See Chapter 28

105.6.52 Flame effects. An operational permit is required to produce combustion through the use of flammable solids, liquids, or gases to produce thermal, physical, visual, or audible phenomenon for entertainment, exhibition, demonstration or simulation. See NFPA 160

105.6.53 Mobile fueling vehicle. An operational permit is required to operate a mobile fueling vehicle where the main business office is located within the boundaries of this jurisdiction. See Chapter 57

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

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

105.6.56 Smoke Control System. An operational permit is required for facilities that have smoke control systems.

105.6.57 Smoke Removal Systems. An operational permit is required for facilities that have smoke removal systems.

105.6.58 Special Activity. An operational permit is required at locations that operate Christmas trees, pumpkin patch lots, and similar activities. See Section 321.

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

105.6.60 Wood and plastic pallets. An operational permit is required for new and existing facilities which store more than 50 idle pallets on site, either inside or outside of a building. See Section 320.

Justification: The purpose of this amendment is to add operational permits.

105.7.1

105.7.1 Fire suppression and extinguishing systems.

A construction permit is required for the following:

1. Installation of or modification to an fire suppression and extinguishing systems.
2. Replacement of recalled fire protection components.

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

Justification: Without a construction permit the system will not receive an inspection to verify that the replacement of recalled devices were correctly installed, hydrostatically tested, connected to the fire alarm system or monitoring device and function properly.

105.7.3

105.7.3 Compressed gases. When the compressed gases in use or storage exceed the amounts listed in Table 105.6.8, 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.

A construction permit is required to install, extend, alter, or modify a medical gas system.

Exception: Level 3 compressed air and/or piped vacuum systems as defined by NFPA 99, *Standard for Health Care Facilities*.

Justification: To clarify the intent of the code to include construction permits for medical gas systems and to provide an exception for Level 3 systems.

105.7.4

105.7.4 Cryogenic fluids. A construction permit is required for installation of or alteration to ~~outdoor~~ stationary cryogenic fluid storage systems and for fog effect systems that utilize CO_2 or cryogenic fluids where the system capacity exceeds the amounts listed in Table 105.6.8 or Table 105.6.10. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

Justification: Fog effects utilizing CO_2 present unique health hazards to humans. If the fog effect is allowed to engulf customers their oxygen content can be reduced to below 19.5%, creating a health hazard. This amendment provides for permits and inspections to ensure public safety.

105.7.6

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

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

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

Justification: Without a construction permit the system will not receive an inspection to verify that the devices were correctly installed, connected to the fire alarm system or monitoring device and function properly.

105.7.12

105.7.12 ~~Private~~ Fire Hydrants and Associated Supply Piping. Fire code official approval is required for the installation or modification of ~~private~~ fire hydrants, including temporary hydrants, and the associated supply piping. The fire code official may require construction permits for this activity.

Justification: The purpose of this amendment is to require fire department permits for all fire hydrants installed, not just those that are private. In addition, the permit requirements extend to the associated supply piping, whether underground or aboveground. This change supports the practice by jurisdictions in requiring fire department involvement in review and approval of site civil improvement plans.

105.7.17 thru 105.7.24

105.7.17 Access gates. A construction permit is required for the installation of or modification to each access gate (including both manual and automatic gates) obstructing a fire apparatus access road. See Chapter 5

105.7.18 Fire apparatus access road plan. A construction permit is required for the installation of or modification to a fire apparatus access road required for access to a protected premise. See Chapter 5 and Appendix C

105.7.19 Fire Protection Report. A permit is required for the review and approval of a Fire Protection (Life Safety) Report. See Chapter 9.

105.7.20 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 K

105.7.21 Heliports, Helistops, and Emergency Landing pads. A construction permit is required for the installation of or modification to a heliport, helistop, and/or emergency landing pad. See Chapter 20 and NFPA 418

105.7.22 Refrigeration systems. A construction permit is required for installation of a mechanical refrigeration system covered by Section 606.

105.7.23 Smoke Control System. A construction permit is required for the installation of or modification to a smoke control system. See Chapter 9

105.7.24 Smoke Removal System. A construction permit is required for the installation of or modification to a smoke removal system. See Chapter 9

105.7.25 Two-way communication. A construction permit is required for the installation of or modification to a two-way communication system. See Sections 1007.6.3 and 1007.8.

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

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

Justification: The purpose of this amendment is to add those construction permits that are not otherwise required by the Building Code so that these items are inspected for compliance with local regulations.

108

~~SECTION 108~~

~~BOARD OF APPEALS~~

~~108.1 Board of appeals, established. In order to hear and decide appeals of orders, decisions or determinations made by the *fire code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The *fire code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *fire code official*.~~

~~108.2 Limitations on authority. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent method of protection or safety is proposed. The board shall have no authority to waive requirements of this code.~~

~~108.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to hazards of fire, explosions, hazardous conditions or fire protection systems and are not employees of the jurisdiction.~~

Justification: Each jurisdiction in Southern Nevada utilizes a different form of an appeals board thus necessitating the deletion of the base code language.

111.4

111.4 Failure to comply. Any person who shall continue any work after being served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine as determined by the *fire code official*. ~~of not less than ( ) dollars or more than ( ) dollars.~~

Justification: Fines are established in the adopting ordinance of each jurisdiction.

202

DELIVERED AUDIO QUALITY (DAQ). A measure of audio quality over a transmission medium described in Telecommunication Industry Association (TIA). TSB-88 standard. This is a universal standard often cited in system designs and specifications.

DAQ 1 (<8dB SINAD (Ratio of Signal-plus-Noise-plus-Distortion to Noise-plus-Distortion)): Unusable, speech present but unreadable.

DAQ 2 (12±4 dB SINAD): Understandable with considerable effort; frequent repetition due to noise/distortion.

DAQ 3 (17±5 dB SINAD): Speech understandable with slight effort; occasional repetition required due to noise/distortion.

DAQ 3.4 (20±5 dB SINAD): Speech understandable with repetition only rarely required; some noise/distortion.

DAQ 4 (25±5 dB SINAD): Speech easily understood; occasional noise/distortion.

DAQ 4.5 (30±5 dB SINAD): Speech easily understood; infrequent noise/distortion.

DAQ 5 (>33 dB SINAD): Speech easily understood.

DONOR ANTENNA. The outside antenna on the building where an emergency responder radio coverage system operates.

DONOR SITE. The repeater or base station site with which an emergency responder radio coverage system communicates.

DOWNLINK. The radio signal from the agencies base station transmitter to the portable pubic safety subscriber receiver.

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM. An emergency responder radio coverage system is a two-way radio communication system installed to assure the effective operation of radio communications systems for fire, emergency medical services or law enforcement agencies within a building or structure. A system used by firefighters, police, and other emergency services personnel.

FALSE ALARM is the activation or reporting of an alarm for which no such alarm condition, fire or emergency actually exists. Additionally, False Alarm is the willful and knowing initiating or transmission of a signal, message or other notification of an event of fire when no such danger exists.

HELISTOP. The same as "Heliport," except that no fueling, defueling, maintenance, repairs or storage (for longer than 24 hours) of helicopters is permitted.

HIGH-RISE BUILDING. A building with an occupied floor located more than 55 feet (16 764 mm) ~~75 feet (22 860 mm)~~ above the lowest level of fire department vehicle access.

LVMPD – Las Vegas Metropolitan Police Department

Amendment to portions of the definition for OCCUPANCY CLASSIFICATION

Group E, day care facilities. This group includes buildings and structures or portions thereof occupied by more than five children older than 2 ½ years of age who receive educational, supervision or personal care services for less than 24 hours per day.

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

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

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

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

Adult day care

Child day care

Classification as Group E. A child day care facility that provides care for more than six ~~five~~ but no more than 100 children 2½ years or less of age, where the rooms in which the children are cared for are located on a *level of exit discharge* serving such rooms and each of these child care rooms has an *exit* door directly to the exterior, shall be classified as Group E.

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.

Six ~~Five~~ or fewer persons receiving care. A facility having six ~~five~~ or fewer persons receiving *custodial care* shall be classified as part of the primary occupancy.

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

Residential Group R-3. Residential 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*

Boarding houses (nontransient) with 16 or fewer occupants

Boarding houses (*transient*) with 10 or fewer occupants

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

Congregate living facilities (nontransient) with 16 or fewer occupants

Congregate living facilities (*transient*) with 10 or fewer occupants

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

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

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

SOUTHERN NEVADA AREA COMMUNICATIONS COUNCIL (SNACC). The SNACC overseas, manages, and maintains the fire and EMS radio system utilized by multiple jurisdictions in southern Nevada.

UPLINK. The radio signal from the portable public safety subscriber transmitter to the agencies base station receiver.

307.2

307.2 Permit required. A permit shall be obtained from the *fire code official* in accordance with Section 105.6 prior to kindling a fire for recognized silvicultural or range or wildlife management practices, or prevention or control of disease or pests~~, or a bonfire~~. Application for such approval shall only be presented by and permits issued to the owner of the land upon which the fire is to be kindled.

Justification: The purpose of this amendment is to delete the reference to a bonfire. The committee specifically prohibits bonfires in the amendment to 307.4.1. This change to 307.2 supports that amendment.

307.4

307.4 Location. The location for open burning shall not be less than 50 feet (15 240 mm) from any structure, and provisions shall be made to prevent the fire from spreading to within 50 feet (15 240 mm) of any structure.

Exceptions:

1. Fires in approved containers that are not less than 15 feet (4572 mm) from a structure.
2. The minimum required distance from a structure shall be 25 feet (7620 mm) where the pile size is 3 feet (914 mm) or less in diameter and 2 feet (610 mm) or less in height.
3. <u>One and two family dwellings utilizing LPG or natural gas fuels when installed under a construction permit issued by the building code official</u>

307.4.1

307.4.1 Bonfires. ~~A bonfire shall not be conducted within 50 feet (15240 mm) of a structure or combustible material unless the fire is contained in a barbecue pit. Conditions which could cause a fire to spread within 50 feet (15240) of a structure shall be eliminated prior to ignition.~~

<u>Bonfires are prohibited.</u>

Justification: This amendment is made to restrict bonfires, which are seen by the committee as being an unwarranted fire hazard due to the potential for large fire sizes.

307.4.4

<u>307.4.4 Commercial Barbecue.</u> <u>Barbecue pits used for commercial cooking operations in buildings shall be constructed as commercial food heat-processing equipment in accordance with the Mechanical Code. See also Section 904. 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.</u>

Justification: There is nothing on Commercial Barbecues in the 2012 edition of the IFC. This is an existing practice in several jurisdictions.

308.1.4

308.1.4 Open-flame cooking devices. Charcoal burners and other open-flame cooking devices, <u>including electric barbecues that produce open flames,</u> shall not <u>be located above the first story</u>, operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exceptions:

1. One- and two-family dwellings
2. Where buildings, balconies and decks are protected by an automatic sprinkler system, open flame cooking devices utilizing natural gas installed under a construction permit issued by the building code official
3. ~~Where buildings, balconies and decks are protected by an automatic sprinkler system.~~
4. ~~LP-gas cooking devices having LP-gas container with a water capacity not greater than 2½ pounds [nominal 1 pound (0.454 kg) LP-gas capacity].~~

Justification: The phrase regarding electric barbecues addresses past incidents that have occurred with use of electric barbeques in an unsafe manner. The deletion of the exceptions is to ensure that open-flame devices are kept away from combustible construction in all multi-family housing. A new exception is added to allow open flame cooking devices installed under a construction permit is a building protected with fire sprinklers. This is necessary to ensure that outdoor cooking activities do not initiate fires.

308.1.9

308.1.9 Open-flame devices. Open-flame devices shall comply with the applicable requirements of Sections 308.1.9.1 through 308.1.9.5. Fire pits and theatrical flame effects are regulated in Sections 307 and 308.4 respectively.

Exception: One- and two-family dwellings.

Justification: Items 1 though 10 are not applicable to all types of open-flame decorative devices. This revision allows for requirements for specific types of open-flame devices. The word "decorative" has been deleted so that open flame devices for food warming using gelled alcohol with products such as Sterno, Canned Heat etc. may be regulated.

308.1.9.1

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

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

Justification: This replaces the items that are also prohibited in the base Fire Code.

308.1.9.2

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

1. The flame shall be fully enclosed except where openings on the side are not more than 0.375 inch (9.5 mm) in diameter or where the opening over the top is at a distance away from the flame that does not allow a piece of tissue paper to ignite after ten seconds.

2. Candles and tea lights shall be constructed with a device or holder that prevents spillage of wax or liquid fuel at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when held a an angle of 45 degrees.

3. Oil lamps containing more than 8 ounces (237 ml) shall self-extinguish and not leak at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when held at an angle of 45 degrees.

4. Holders and chimneys shall be made of noncombustible materials. Chimneys are not required for candles, oil lamps or tea lights that self extinguish when tipped over.

5. Shades, where used, shall be made of noncombustible materials and securely fastened to the open flame device holder or chimney.

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

Justification: The current regulations for candles, oil lamps and tea lights are restated here.

308.1.9.3

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

Justification: UL has established a listing category for these devices. They are tested for most foreseeable hazards. Allowing only devices that are listed per UL 1370 will preclude gelled alcohol devices that are know to be hazardous such as those sanctioned by the Consumer Products Safety Commission.

308.1.9.4

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

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

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

Justification: UL or any other testing agency has not established a listing category or test method for Sterno, Canned Heat or any other alcohol burning food warming device. Devices such as room service carts, beverage urns, soup tureens, fondue pots, mini-hibachis etc are routinely used in Southern Nevada. This amendment establishes the criteria to be used in approving these for use.

308.1.9.5

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

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

Justification: These devices are currently unregulated by the Fire Code, but present a similar hazard of the other open flame devices within Section 308.

308.3.1

~~**308.3.1 Open flame decorative devices.** Open flame decorative devices shall comply with all of the following restrictions:~~

~~1. Class I or Class II liquids and LP-gas shall not be used.~~

~~2. 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.~~

~~3. 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.~~

~~4. 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 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) it tipped over~~

~~5. The flame shall be 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.~~

~~6. Chimneys shall be made of noncombustible materials and securely attached to the open-flame device.~~

> ~~Exception: A chimney is not required to be attached to any open-flame device that will self-extinguish if the device is tipped over.~~

~~7. Fuel canisters shall be safely sealed for storage.~~

~~8. Storage and handling of combustible liquids shall be in accordance with Chapter 57.~~

~~9. Shades, where used, shall be made of noncombustible materials and securely attached to the open flame device holder or chimney.~~

~~10. Candleabras with flame-lighted candles shall be securely fastened in place to prevent overturning, and shall be located away from occupants using the area and away from possible contact with drapes, curtains or other combustibles.~~

Justification: This section is unnecessary due to the inclusion of 308.1.9.

314.4

314.4 Vehicles. Liquid- or gas-fueled vehicles, <u>aircraft,</u> boats or other motorcraft shall not be located indoors except as follows:

1. Batteries are disconnected <u>or the engine starting system is made inoperable.</u>

2. Fuel in fuel tanks does not exceed one-quarter tank of 5 gallons (19 L) (whichever is least)

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

4. Vehicles, <u>aircraft,</u> boats or motorcraft equipment are not fueled or defueled within the building.

Justification: Additional criteria have been added to address the complexity and variety of indoor displays in Southern Nevada.

315.3.2.1

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 code official* identifying the minimum required width of the corridors or hallways.
5. When required by the *fire code official*, a fire protection report shall be submitted addressing the parameters of storage, including protection requirements, separation requirements, and description of commodity type and configuration.

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.

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

Justification: This amendment provides criteria for storing combustible materials adjacent to egress corridors or hallways.

319.1

SECTION 319

EXHIBITIONS AND TRADE SHOWS

319.1 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 105.6.

Justification: Due to the high occupant loads, special hazards, displays, display cooking, open flames, pyrotechnics and the transient nature of combustible loading associated with trade show and exhibitions, special attention is required for these events. The NFPA Life Safety Code, NFPA 101 has set national precedents by also covering this topic for New Assembly Occupancies as with as Existing Occupancies in the Special Provisions for Exhibition Facilities Sections 12.7.5 and 13.7.5 respectively.

A special use permit and additional physical inspections are required. The permitting process allows for an evaluation of hazards presented by the exhibition or tradeshow. Physical inspection is done to ensure that the hazards are limited to those covered by the permit. New Sections 319.2 through 319.5 giving specific requirements follow.

319.2

319.2 Exhibits (Booths). Exhibits (booths) shall comply with 319.2.1 through 319.2.5.

319.2.1 Automatic Sprinklers

319.2.1.1 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.

319.2.1.2 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.

319.2.1.3 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.

319.2.1.4 Hydraulic calculations shall be provided to the Authority Having Jurisdiction when the sprinklers required by Section 319.2.1.1 and 319.2.1.2 are 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.

319.2.2 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.).

319.2.3 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).

319.2.4 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.

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

(1) Noncombustible 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 NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*

(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 807.4.2.1 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 with UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes*.

(9) Alternate materials as approved by the fire code official.

319.2.6 Fire extinguishers. Except as required for cooking operations permitted by Section 319.4 or for uses described in Table 906.1, additional fire extinguishers are not required to be added to address minimum travel distance requirements around temporary exhibit booths or temporary display items.

Justifications:

Sprinklers:

Section 319.2.1 requires that booths, with a ceiling, that exceed 1,000 sq ft, be provided with automatic sprinklers. Clark County has been enforcing an upper limit of 1,000 sq ft for several years. Internal review indicates that the 1,000 sq ft limit was selected as a matter of work flow management and an enforcement decision. An exception is provided for short-term exhibits open less than 7 calendar days with limited hazards

Horizontal Separation between Booths:

This requirement was also taken from the 2009 edition of NFPA 101. It requires a 8 ft separation between booths and groups of booths that exceed 1,000 sq ft. For reference, kiosks of the same dimensions have a minimum separation distance of 20 ft according to Section 402.6.2 of the 2012 edition of the IBC.

Travel Distance between Booths:

The 50 ft travel distance within booths was taken from NFPA 101, Section 13.7.5.3.2. The arrangement of a travel distance within a booth is similar to a common path of travel. The common path of travel within assembly occupancies is limited to 30 ft according to Section 1028.8 of the 2012 IFC. The intent is to limit convoluted paths of travel within the booth. A 50 ft travel distance is a reasonable and attainable limit.

Construction Materials:

Since these construction requirements have been adopted by NFPA 101 for several years, it is reasonable to assume that most pre-manufactured booths will be in compliance with the construction requirements. The proposed section was modified to reference textile wall coverings and foamed plastics in compliance with Chapter 8 of the 2012 IFC. Other plastics may comply with the 2012 IBC. An additional item is added to allow approval of alternate materials by the fire code official.

319.3

319.3 Decorative Curtains, and Textiles

319.3.1 Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 319, 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.

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

319.3.3 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.

319.3.4 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.

319.3.5 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 319.3.1 through 319.3.3.

Justification: Section 319.3.1 and Section 319.3.2: NFPA 701 is used to demonstrate fabrics can resist an initial ignition. It is repeated in this Section to specifically exclude other tests methods such as Title 19 California Code of Regulations Subchapter 1 and CAPI-84 Specification for Flame Resistant Materials Used in Camping Tentage for Tents that are often submitted as equivalent. NFPA 701 is the primary fabrics flammability test recognized by the ICC and NFPA.

Section 319.3.3: This section prohibits draperies from obstructing any means of egress components or fire safety equipment.

Section 319.3.4: This section is to provide clearance above the suspended curtains or draperies sufficient to permit fire gases to reach automatic sprinkler operating elements and allow water discharge to be directed over their tops.

Section 319.3.5 allows an unlimited amount of drape in sprinklered buildings. The NFPA and FM Global have stated that the amount of hanging fabrics that have passed NFPA 701 may be unlimited due to automatic sprinkler protection and the lack of fire loss data related to curtains and draperies as the first ignited material. This is ongoing practice in this community, and the loss history indicates this practice is not a hazard.

319.4

319.4 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:
    a. Metal lids sized to cover the horizontal cooking surface are to be provided.
    b. The cooking surface is limited to 288 sq in (two sq ft).
    c. Cooking equipment exceeding 288 sq in aggregate surface area shall be provided with an automatic extinguishing system installed according to NFPA 17A.
    d. Cooking equipment exceeding 288 sq in shall be provided with a mechanical exhaust system in accordance with the mechanical code.
    e. The fryer is to be separated from all other equipment by a distance not less than 24 in.
    f. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
    g. The volume of cooking oil per appliance is not to exceed 3 gal.
    h. The volume of cooking oil per booth is not to exceed 8 gal.
    i. 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 904.11.5.
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.

Justification: These requirements are mainly taken from the 2006 edition of NFPA 101. The intent is to allow limited demonstration cooking and prohibit full scale commercial cooking.

Operations that produce grease laden vapors are not defined by NFPA or IFC documents. Small deep fat frying is being allowed for small appliances such as table top "Fry-Daddy" products. A 2 by 1 ft dimension is allowed by NFPA 101 (288 sq in) for deep fat fryers. This was also extended to stove tops.

Class K fire extinguishers are being required for all cooking operations in exhibition halls.

LP-gas is limited to small cylinders as found in single omelet stations. These are the size used for camp stoves. Larger LP-gas tanks, like those used for barbeque grills are prohibited.

319.5

319.5 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.

Justification: Due to the high occupant loads and varied items contained in exhibitions, the AHJs find it important to have accurate exhibition plans submittals. The intent of this amendment is to create a list of items required on plans so that submittals are consistent.

320

SECTION 320 PALLETS

320.1 General. New and existing facilities with either storage or rehabilitation of pallets shall be in accordance with Sections 320.1 thru 320.6.3 and Section 2803.

320.2 Permits. An operational permit is required for new and existing facilities which store more than fifty (50) idle pallets on site, either inside or outside of a building. For a commercial pallet yard, a site plan demonstrating compliance with Section 320 shall be submitted for review and approval prior to issuance of the operational permit.

320.3 Fire Flow. The minimum required fire flow in pallet storage yards shall not be less than 2,000 gpm (7571 L/m). For storage yards with stable piles greater that 6,200 sq. ft. (576 m^2) the required fire flow will follow the requirements of Appendix B, Table B105.1 for Type V-B construction. Pallet storage yards shall not exceed the available fire hydrant flow and spacing.

320.4 Fire Hydrants. Fire hydrants required for fire flow purposes for pallet storage array(s) shall be provided within three hundred (300) feet (152.4m) of hose lay to all pallets.

320.5 Fire Department Access. Fire apparatus access roads in accordance with Section 503 shall be located within one hundred fifty (150) feet (45,720mm) of all portions of the pallet storage array(s). Permanent delineation of on-site fire apparatus access roads shall be provided as required by the *fire code official*.

320.6 Idle Pallet Storage

320.6.1 Exterior storage and storage arrays at commercial pallet yards. Exterior pallet storage arrays shall comply with all of the following:

1. Stacks shall not exceed a height of fifteen (15) ft. (4.57 m) or any height restriction set by other ordinances of the jurisdiction, whichever is lower.
2. Stacks shall be no closer than eight (8) ft. (2.44 m) to any property line or a distance equal to the stack height, whichever is greater.
3. Stacks shall be no closer than eight (8) ft. (2.44 m) to any other on-site storage.
4. Stacks shall be no closer than fifteen (15) ft. (4.57 m) to any on-site structure.
5. Stacks shall be arranged to form stable piles.
6. Piles shall not contain more than six thousand (6,000) cu. ft. (170 m^3) of pallets.
7. Piles shall be separated by a minimum distance of eight (8) ft. (2.44 m).
8. Piles shall be arranged in a grid system to form pallet storage arrays with a maximum dimension of fifty (50) ft. by fifty (50) ft. (15.25 m by 15.25 m).
9. Pallet storage arrays shall be separated by a minimum distance of twenty four (24) ft. (7.32 m).

320.6.2 Exterior storage at other occupancies (not a commercial pallet yard). Exterior pallet storage shall comply with all of the following:

1. Stacks shall not exceed a height of fifteen (15) ft. (4.57 m) or any height restriction set by other ordinances of the jurisdiction, whichever is lower.
2. Stacks shall be no closer than eight (8) ft. (2.44 m) to any property line or a distance equal to the stack height, whichever is greater.
3. Stacks shall be no closer than eight (8) ft. (2.44 m) to any other on-site storage.
4. Stacks shall be no closer than fifteen (15) ft. (4.57 m) to any on-site structure. In order for stacks to be closer than fifteen (15) ft. to an on-site structure, they shall maintain minimum clearances based on the quantity of pallets and the level of protection provided by the building construction as follows:
   a. 50 pallets or less adjacent to a masonry building with no openings within twenty (20) ft. (6 m) of the pallets, or a masonry building with protected openings and outside automatic sprinklers is zero (0) ft. (0 m).
   b. 51 to 200 pallets adjacent to a masonry building with no openings within twenty (20) ft. (6 m) of the pallets, or a masonry building with protected openings and outside automatic sprinklers is eight (8) ft. (2.44 m).
   c. 50 pallets or less adjacent to a fully sprinklered wood or metal building is eight (8) ft. (2.44 m).
   d. 51 to 200 pallets adjacent to a fully sprinklered wood or metal building with outside automatic sprinklers is eight (8) ft. (2.44 m).
5. Stacks located less than fifteen (15) ft. (4.57 m) from an exterior building wall shall not exceed a height equal to thirty (30) inches below the roof line elevation, or fifteen (15) ft. (4.57 m), or any height restriction set by other ordinances of the jurisdiction, whichever is lower.
6. Stacks shall be arranged to form stable piles.
7. Where more than 200 pallets are stored exterior to the building, a custom fire protection plan shall be submitted to and approved by the fire code official

320.6.3 Interior storage. Interior storage pallets shall be in accordance IFC Chapter 32, High-Piled Combustible Storage.

Justification: This amendment has been in the previous code cycles. Pallet storage is not addressed thoroughly in the base code. The committee is aware of exterior pallet storage fires and the purpose of this amendment is to limit the fuel load of idle pallets and to provide access to all parts of pallet rehabilitation yards.

321

SECTION 321

SPECIAL ACTIVITY LOTS

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

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

321.3 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.

321.4 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

321.4.1 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.

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

321.4.3 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.

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

321.4.5 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.

321.4.6 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.

321.5 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.

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

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

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

321.6.3 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.

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

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

Justification: The purpose of this amendment is to codify existing practice regarding activities commonly associated with special events and holidays, such as Christmas tree lot sales.

322

SECTION 322

MOTION PICTURE AND TELEVISION PRODUCTION STUDIO, SOUND STAGES, PRODUCTION FACILITIES, AND PRODUCTION LOCATIONS

322.1 General. The design, construction, operation, and maintenance of permanent and temporary soundstages, production facilities, as well as use of production locations, used in motion picture and television industry productions shall comply with NFPA 140 – *Motion Picture and Television Production Studio, Sound Stages, Production Facilities, and Production Locations*, and this section.

322.2 Permits. Permits shall be required as specified in this section and shall comply with Section 105.

Exceptions:

1. Minor production location operations when approved by the *fire code official.*
2. The filming or live broadcasts of news or sporting events.

322.2.1 Construction Permits. A construction permit shall be obtained prior to commencement of construction.

322.2.2 Operational Permits. An operational permit is required to operate a motion picture and television production studio, sound stage, production facility, or production location.

322.3 Other Permits. A separate permit(s) in accordance with Section 105 shall be obtained in conjunction with an operational permit.

322.4 Housekeeping. All Studios, Sound Stages, Production Facilities and Locations shall maintain proper housekeeping in accordance with this code.

322.5 Fire Department Standby. At the discretion of the *fire code official*, due to the use of pyrotechnics or other hazards, fire department personal and apparatus may be required to standby. Fees associated with fire department standby shall be the responsibility of the applicant. The *fire code official* may require fees to be placed in escrow.

322.6 Temporary Production Locations

322.6.1 General. Production Locations shall meet the requirements of this code except as otherwise specified in this section.

322.6.2 Interior Sets or Stages. Interior sets or stages are only permitted to be constructed in sprinklered buildings.

322.6.3 Sprinkler Obstructions. Where Interior sets and stages cause sprinkler obstructions exceeding 600 ft^2 (55.7m^2) in area, such obstructions shall be protected in accordance with NFPA 13.

Exceptions:

1. Where the building is protected with a sprinkler system meeting the design criteria for Extra Hazard, Group 2, obstructions shall not be required to be protected.
2. Where the building is protected by an automatic sprinkler system failing to meet the minimum sprinkler design requirements of NFPA 140, obstructions shall be protected by heat detectors installed in accordance with requirements of this section.

322.7 Electrical. The existing building's electrical system shall not be used to supplement lighting and power systems used by the production company unless specifically approved and permitted by the *code official*.

322.7.1 Electrical power connections made to the site electrical service shall be made by a licensed electrician under an electrical permit.

322.7.2 Portable power cables shall be positioned to not obstruct egress.

322.7.3 Auxiliary power cables supplied from mobile generators or adjacent buildings shall not be permitted to be routed through fire-rated windows and doors.

322.8 Structural Loading. Sets, scenery, rigging, and other equipment shall not impact the structural integrity of existing buildings. Additional loads applied to the building shall require approval from the *code official*. At the request of the *code official*, an engineering analysis from a licensed structural engineer shall be provided.

322.9 Fire Department Access. Fire department access shall be maintained at all times in accordance with the fire code.

322.10 Heat Detectors. Where heat detectors are installed to mitigate sprinkler obstructions, the heat detector system shall be installed in accordance with this code except as otherwise specified in this section.

322.10.1 Fire Alarm Panels. Fire Alarm panels shall be utilized in accordance with their listing. Panels may be temporarily supported by sets, platforms, or pedestals, for temporary sets which will be erected for less than 180 days.

322.10.2 Notification. The fire alarm panel shall be connected to an approved listed central, proprietary, or remote station service, and a local alarm which will give an audible signal to a constantly attended location such as a security post.

322.10.3 Heat Detectors. Heat detectors required by this section shall be defined as a portable system as it is intended to be reinstalled when platforms or sets are changed, and after filming has been completed for the day. Heat detectors shall be secured to standard outlet boxes, which may by temporarily supported by sets, platforms, or pedestals.

322.10.4 Wiring. Wiring for temporary (less than 180 days) or portable fire alarm systems do not have to meet the requirements of NEC 300.1 as revised locally.

Justification: Filming and movie production in the Southern Nevada area has become a regular occurrence. This amendment is provides basic fire and life safety requirements. Said requirements are standard for similar events in the Southern California area and widely understood and utilized at this time. These requirements are not for the single "man on the street" type activities.

401.3.2

401.3.2 Alarm activations. Upon activation of a ~~fire alarm~~ water flow signal, employees or staff shall immediately notify the fire department.

> **Exception:** For approved proprietary supervising station systems (self-monitoring systems), the fire department shall be notified as required by the *fire code official*.

Justification: Local jurisdictions dispatch units upon water flow activations only, unless a true fire event is confirmed by a person. The reason to add the exception is in order to recognize that proprietary supervising station systems may have a different procedure, and that procedure must be approved by the *fire code official*.

401.9

401.9 Fines for false alarms and nuisance alarms. The *fire code official* is authorized to levy fines to the installer, maintenance company, owner or occupant of a building as follows. In the case of any two false or nuisance alarms, or combination thereof, within a consecutive thirty day period, the *fire code official* may issue warning notices to the owners or occupants of the building and to the alarm business or businesses responsible for the service, maintenance and monitoring of the system. This notice shall indicate that any additional false or nuisance alarms within a thirty day period will be subject to the penalties prescribed in this code.

Justification: This amendment is similar to one currently found within the Clark County Fire Code. Both false alarms and nuisance alarms have been major problems for many years. These types of alarms not only take units out of service for a time, but it also increases the risk of accidents when responding to an event. This proposal provides the *fire code official* with a tool to attempt to reduce the number of false and nuisance alarms.

502

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

AGENCY.

DELIVERED AUDIO QUALITY (DAQ).

DONOR ANTENNA.

DONOR SITE.

DOWNLINK.

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM.

FIRE APPARATUS ACCESS ROAD.

FIRE COMMAND CENTER.

FIRE DEPARTMENT MASTER KEY.

FIRE LANE.

KEY BOX.

LAS VEGAS METROPOLITAN POLICE DEPARTMENT (LVMPD).

SOUTHERN NEVADA AREA COMMUNICATIONS COUNCIL (SNACC).

TRAFFIC CALMING DEVICES.

UPLINK.

503.2.1

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 24 ~~20~~ feet (7315 mm) ~~(6096 mm)~~, exclusive of shoulders, except for approved access ~~security~~ gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

Justification: This amendment is established to address committee concerns in form, although the requirements within this amendment are existing requirements. The purpose of this amendment is to carry forward code items as required in the last code cycle for the minimum width of lanes. The purpose of this amendment is to set the minimum width of fire access lanes to 24 feet.

503.2.3

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

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

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to provide guidance as to the minimum loading requirement for fire access lanes, and to set forth the surface requirements. Recent surveys indicate that the weight of emergency vehicles range from 82,000 to 92,000 pounds per vehicle, typically on three axles.

503.2.4

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall ~~be determined by the *fire code official*.~~ be no less than 28 feet inside turning radius and 52 feet outside turning radius.

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to set the minimum turning radius required for fire apparatus.

503.2.7

503.2.7 Grade. The grade of the fire apparatus access road shall not exceed 12 percent ~~be within the limits established by the *fire code official* based on the fire department's apparatus~~.

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to set the maximum gradient along the fire access lane.

503.2.8

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall be a maximum of 6 percent grade for 25 feet (7.6 m) of approach/departure. ~~within the limits established by the *fire code official* based on the fire department's apparatus.~~

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to set the grades that are allowed for the approach and departure to a grade.

503.3

503.3 Marking. ~~Where required by the *fire code official*, approved signs or other approved notices or markings that include the words NO PARKING – FIRE LANE shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which fire lanes are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility.~~

Fire apparatus access roads shall be marked where required to prohibit parking and other obstructions. Marking shall consist of painting the curb, or the side of the street, where no curb is present, with a suitable coat of industrial red enamel along the entire length of road where parking is prohibited. Each section of curb that is

painted red shall also be marked by signage stating "NO PARKING FIRE LANE" (Type A sign). Signs 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.

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

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

"FIRE LANE"

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

"ON_STREET PARKING IN MARKED FIRE LANES PROHIBITED"

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

"NO PARKING FIRE LANE"

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 SIGN

TYPE B SIGN

TYPE C SIGN

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to specify requirements for marking of fire access lanes where obstructions are prohibited, also in accordance with state law. The proposal requires that red-painted curbs be provided along the areas where obstructions are prohibited. The proposal provides an option for fire lane signage, and for stenciling fire lane wording on the curb.

503.4.1

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.

Justification: The purpose of this amendment is to ban the installation of speed bumps and speed humps. The amendment allows for the removal of existing non-compliant traffic calming devices. The amendment allows for the installation of speed humps, subject to the approval of the *fire code official*, on private roads used for apparatus access.

503.6

503.6 ~~Security~~ Access Gates. The installation of ~~security~~ access gates across a fire apparatus access road shall be approved by the *fire* ~~chief~~ *code official*. Where ~~security~~ access gates are installed, they shall have an approved means of emergency operation. The ~~security~~ access gates and the emergency operation shall be maintained operational at all times. The minimum clear opening width shall be 20 feet. ~~Electric gate operations, 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 F 2200.~~

503.6.1 Permit. A Fire Department installation permit is required to install a gate that obstructs a fire apparatus access road. A separate permit is required for each gated entrance.

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

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

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

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

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

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

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. Three sets of plans and specifications for fire apparatus access road gates shall be submitted for review and approval prior to construction. Included in the submittal shall be the following information:

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

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

Justification: The purpose of this amendment is to define the requirements for installation and permitting of gates across fire apparatus access roads.

505.1

505.1 Address Identification. New and existing buildings 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. Where required by the *fire code official*, address numbers shall be provided in additional *approved* locations to facilitate emergency response. Address numbers shall be Arabic numerals or alphabet letters. ~~Numbers shall be a minimum of 4 inches (1002mm) high with a minimum stroke width of 0.5 inch (12.7mm)~~ 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 numbers shall be maintained.

Justification: Each AHJ will have a specific standard for the installation of addressing and building identification.

505.3

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.

Justification: This amendment is intended to provide consistency for regional application of codes.. The purpose of this amendment is to clarify when a development directory is required. The directory is necessary for those developments where multiple residential buildings are contained in a subdivision and where the buildings do not all have public street access. Typically, this amendment applies to apartment and condominium complexes.

507.1

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

Justification: The purpose of this amendment is to clarify that the water supply must be potable, that the section applies to both public and private hydrants, and that the design and installation also includes compliance with Appendices B and C, NFPA 24, and the local standards by UDACS.

507.5.7

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

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

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

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

Justification: The purpose of this amendment is to define paint and marking requirements for private on-site fire hydrants.

508.1.3

508.1.3 Size. The fire command center shall be a minimum of 0.015 percent of the total building area of the facility served or 200 square feet (19m^2) in area, whichever is greater, with a minimum dimension of 0.7 times the square root of the room area, or 10 feet (3048 mm), whichever is greater

Justification: The main items in this proposal were approved for the last code cycle. The purpose of this amendment is to provide a means to have larger fire command centers for larger facilities. The effect of this change is that buildings that are greater than 1.33 million square feet in total area will require larger fire command centers than the minimum required size of 200 square feet. For reference, this formula would require a fire command center of 750 square feet for a building that is 5 million square feet, and would require a fire command center of 1,500 square feet for a building that is 10 million square feet. These are not seen as unreasonable sizes in comparison to the building size. There have been problems in the past with fire command centers that are sized

too small for the amount of equipment required for the building. Obviously, the larger buildings will have more equipment due to the amount of elevators, generators, smoke control systems, fire alarm nodes, plans, etc, that are required for larger buildings. Further, the larger buildings will typically also have unusual design features, such as deluge systems, which would require additional control panels in the fire command center. It is important to anticipate these issues and develop requirements for larger rooms to accommodate the equipment required in larger facilities.

508.1.5

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

1. The emergency voice/alarm communication control unit.
2. The fire department communication system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicator and controls for air distribution systems, including smoke removal systems where required by Section 403.4.7 of the International Building Code.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. An *approved* Building Information Card that contains, but is not limited to, the following information:
    - 13.1 General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), estimated building population (i.e., day, night, weekend);
    - 13.2 Building emergency contact information that includes: a list of the building's emergency contacts (e.g, building manager, building engineer, etc.) and their respective work phone number, cell phone number, and e-mail address;
    - 13.3 Building construction information that includes: the type of building construction (e.g., floors, walls, columns, and roof assembly);
    - 13.4 Exit stair information that includes: number of *exit stairs* in the building, each *exit stair* designation and floors served, location where each *exit stair* discharges, *exit stairs* that are pressurized, *exit stairs* provided with emergency lighting, each *exit stair* that allows reentry, *exit stairs* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, location of sky lobby, location of freight elevator banks;

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

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

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

14. A new ~~W~~work table with a minimum size of three (3) feet by seven (7) feet capable of holding plans in an open position.

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

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

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

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

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

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

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

Justification: Correlation with the IBC. Item 21 is added to codify the practice of requiring a printer in the Fire Command Center.

510

SECTION 510

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communications systems of the jurisdiction at the exterior of the building. System design shall be in accordance with this section. This section shall not require improvement of the existing public safety communication systems outside the building.

Exceptions:

~~1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.~~

1. ~~2.~~ Where it is determined by the *fire code official* that the radio coverage system is not needed.

2. ~~3.~~ In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.

510.1.1 Emergency responder radio coverage system in new buildings. An emergency responder radio coverage system shall be provided throughout buildings when any of the following apply:

1. **High-rise buildings**. Buildings with a floor used for human occupancy located more than 55 feet above the lowest level of fire department vehicle access.
2. **Underground and below grade buildings**. Buildings having a floor level below the finished floor of the lowest level of exit discharge of any level.
3. **Other buildings.** The *fire code official* is authorized to require a technical opinion and report, in accordance with Section 104.7.2, for buildings whose design, due to location, size, construction type, or other factors, could impede radio coverage as required by Section 510.4.1. The report shall make a recommendation regarding the need for an emergency responder radio coverage system.

510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with approved radio coverage for emergency responders as required in Chapter 11 and locally adopted ordinances. Existing buildings that do not have *approved* radio coverage, as determined by the Fire Chief, in accordance with Section 510.4.1 shall be equipped with such coverage in accordance with Section 510 within a time frame established by the *fire code official*.

Building owners shall submit to the *fire code official* a radio signal strength study, technical opinion and report prepared in accordance with Section 104.7.2. The report shall identify the area(s) requiring an emergency responder radio coverage system to comply with Section 510.4.1.

Exceptions:

1. Where *approved* by the *fire code official*, an existing *approved* wired communication system in accordance with Section 907.2.13.2 shall be permitted to be maintained in lieu of an approved radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

510.3 Permits required. Construction and operational permits shall be required as set forth in Section 105.6 and 105.7. ~~A construction permit is required for the installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.~~

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

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

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

a. A floor plan that indicates the use of all rooms, emergency responder radio coverage system equipment locations, power panel connections, raceway routing layout, conduit and conductor types and sizes, compliance with survivability criteria and locations of building access to the equipment.

b. A roof plan showing the location of antenna(s) including a line of site plan to agency transmitting and receiving antenna(s).
c. Schematic drawings of the electrical system, backup power, antenna system and other associated equipment.
d. Rack and equipment cabinet plans showing arrangement and configuration of emergency responder radio coverage system equipment.
e. System riser diagram(s).

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

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

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

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

510.4 Technical requirements. Systems, components, and equipment required to provide emergency responder radio coverage system shall comply Sections 510.4.1 through 510.4.2.5 and NFPA 72.

510.4.1 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building and in 100 percent of critical areas, such as the emergency command center(s), the fire pump room(s), exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, mechanical penthouses, elevator machine rooms, and other areas deemed critical by the *fire code official*, meet the signal strength requirements of Sections 510.4.1.1 and 510.4.1.2.

510.4.1.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm with a DAQ of 3.4 or better, from the emergency responder site for the radio associated to that radio system shall be receivable within the building.

510.4.1.2 Minimum signal strength out of the building. A minimum signal strength of -95 dBm with a DAQ of 3.4 or better shall be received by the ~~agency's~~ emergency responder's radio system when transmitted from an *approved* portable radio with a maximum of 3 watts of strength within the building.

510.4.2 System design. The emergency responder radio coverage system shall be designed in accordance with ~~Sections 510.4.2.1 through 510.4.2.5~~ Section 510.4 and NFPA 72.

510.4.2.1 Amplification systems allowed. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.

510.4.2.1.1 Amplification Components. Systems shall be equipped with a radiating cable system and/or a distributed antenna system (DAS) with FCC certified signal boosters, or systems otherwise approved in order to achieve the required adequate radio coverage.

510.4.2.1.2 Reliability Factor. The system shall be designed and capable of providing a 99% reliability factor.

510.4.2.1.3 Isolation. Isolation shall be maintained between the donor antenna and all inside antennas and shall be a minimum of 15 db above the signal booster gain under all operating conditions.

510.4.2.1.4 Human exposure to radio frequency and electromagnetic fields. The system design, and installation, shall in no case exceed the FCC's OET 65 Standards.

510.4.2.2 Technical criteria. The *fire code official* shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the inbound/outbound frequency pairs, ~~the various frequencies required, the location of radio sites,~~ the location and effective radiated power (ERP) of radio sites used by the emergency responder radio coverage system, the maximum propagation delay (in microseconds, nominally 25 microseconds or less), and other supporting technical information.

510.4.2.2.1 System radio frequencies. The emergency responder radio coverage system shall be capable of transmitting all public safety radio frequencies (700 and 800 Megahertz public safety bands) assigned to the agency, and be capable of using any modulation technology. For LVMPD the frequency range is from 769 Megahertz to 775 Megahertz (downlink) and 799 Megahertz to 805 Megahertz (uplink). For SNACC the frequency range is from 806 MHz to 815 MHz (uplink) and 851 MHz to 860 MHZ (downlink)

510.4.2.2.2 Degraded performance in emergencies: The system shall be designed to allow degraded performance in adverse conditions, such as abnormally high temperatures resulting from nearby fires, extreme voltage fluctuations or other abnormal conditions that may occur during an emergency. Circuits that intentionally disable the signal booster in such situations (i.e. under/over voltage, over/under current, over/under temperature, etc.) will not be implemented as the standard mode for public safety applications. It is the purpose of this specification to assure the maximum possible level of communications to public safety personnel depending upon the signal booster even to the extent of damaging the signal booster as long as some communications benefit can be provided during the emergency.

510.4.2.2.3 Mode of Operation. The system shall be normally powered on and shall continuously provide passing of frequencies within the public safety bands.

510.4.2.3 Secondary power. Emergency responder radio coverage system shall be provided with an *approved* secondary source of power. The secondary source of power shall be either a UPS battery system or an emergency generator. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least 24 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.

510.4.2.3.1 Battery Systems. The active components of the installed system or systems shall be capable of operating on an independent battery system for a period of at least 24 hours without external power input. The battery system shall automatically charge in the presence of external power input.

510.4.2.3.2 Monitoring. Monitoring shall be provided to annunciate the status of the system. A single supervisory signal shall be sent to the fire alarm control unit upon any off-normal condition. The following conditions shall be monitored:

a. Active component trouble
b. Loss of normal ac power
c. Battery system trouble

510.4.2.4 Signal booster component requirements. If used, signal boosters shall ~~meet the following requirements~~ be compatible with both analog and digital communications simultaneously at the time of installation.

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type/IP65 waterproof cabinet.
2. The battery system shall be contained in a NEMA 3-type or NEMA 4-type/IP65 waterproof cabinet.
3. ~~The signal booster and battery system shall be electrically supervised and monitored by a supervisory service, or when *approved* by the *fire code official*, shall sound an audible signal at a constantly attended location.~~
4. ~~Equipment shall have FCC certification prior to installation.~~

~~510.4.2.5 Additional frequencies and change of frequencies.~~ ~~The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.~~

510.4.2.5 System Components. System components shall be in accordance with this section.

510.4.2.5.1 Component Approval and Compatibility. Components utilized in the installation of the emergency responder radio coverage system, such as repeaters, transmitters, receivers, signal boosters, cabling, fiber distributed antenna systems shall be approved and shall be compatible with the agencies public safety radio systems.

510.4.2.5.2 Filters. Filters shall be provided in accordance with this section. Filters shall only pass the emergency responder radio coverage system frequencies. The signal booster shall include re-tunable or replaceable filters to accommodate rapid and economic passband changes in the event of mandatory FCC changes within the 806-824 and 851-869 MHz band. The use of non-adjustable and non-replaceable RF input and output filters is prohibited.

510.4.2.5.2.1 External Filters. Permanent external filters and attachments shall not be permitted.

510.4.2.5 2.2 Reject filters. Notch filter sections shall be incorporated to minimize adjacent channel cellular and SMR (Nextel) degradation of the signal booster performance. The minimum downlink band adjacent band rejection shall be 35 dB or greater at 865 MHz to 870 MHz and769 Megahertz to 775 Megahertz.

510.4.2.5.2.3 Passive filters. Passive filter equipment shall have a passband of 700-900 Mhz.

510.4.2.5.2.4 Analog / Digital Capability. The system shall be 100% compatible with analog or digital modulations after installation without additional adjustment or modifications.

510.4.2.5.2.5 Output Level control. An automatic output leveling circuit shall be included for both passbands with a minimum dynamic range of 60 dB, less any gain reduction setting, to maintain FCC out of band and spurious emission compliance.

510.4.2.5.2.6 Cable.

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

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

510.4.2.5.2.7 Splitters. Only fixed value splitters shall be used.

510.4.2.5.2.8 *Agency* Donor Antenna. Donor antennas shall be used to transmit and receive signals from each *agency* donor site. Facilities served by the Las Vegas Metropolitan Police Department (LVMPD) shall be provided with a specific donor antenna directed to a LVMPD donor site. Additional donor antenna(s) shall be directed at other *agency (i.e., SNACC)* donor sites.

510.4.2.5.2.9 In-building antennas. In-building antennas shall be fixed mount.

510.5 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with Sections 510.5.1 through 510.5.5.

510.5.1 Approval prior to installation. No amplification system capable of operating on frequencies or causing interference on frequencies assigned or licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the *fire code official*. The building manager/owner shall suspend and correct other equipment installations that degrade the performance of the public safety radio system or emergency responder radio coverage system.

510.5.1.1 Workmanlike installation and mechanical execution of work. Circuits, conduit and systems shall be installed in a neat and workmanlike manner in accordance with the requirements of the National Electrical Code as adopted by the jurisdiction.

510.5.1.2 Conduit and equipment support. Conduit and equipment supports shall be supported by the building structure in such a manner that damage will not occur by normal building use in accordance with the requirements of the National Electrical Code as adopted by the jurisdiction.

510.5.2 Minimum qualifications of personnel. The minimum qualification of the system designer and lead installation personnel shall include:

1. A valid FCC-issued general radio operators license, and
2. Certification of in-building system training issued by a nationally recognized organization or school or a certificate issued by the manufacturer of the equipment being installed.

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

~~510.5.3 Acceptance test procedure. When an emergency responder radio coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:~~

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

~~3. Failure of a maximum of two nonadjacent test areas shall not result in failure of the test.~~

~~4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas shall be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.~~

~~5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be 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 area. Failure in the selected test location shall be considered failure of that test area. Additional test location 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 insure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and subsequent annual inspections.~~

510.5.3 Commissioning Test. It is the building owner's responsibility to ensure that a commissioning test of the radio repeater or amplification system occurs prior to final acceptance by the agency. The test shall ensure that two-way coverage on each floor of the building meets the minimum signal strength coverage requirements described in Section 510.4.1. At the conclusion of the testing a report which shall verify compliance with this section shall be submitted to the *fire code official*. A copy of this report shall be maintained on site.

510.5.3.1 FCC compliance during testing. All testing must be done on frequencies authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies. The installer shall coordinate with the *fire code official* the frequencies to be utilized during testing.

510.5.3.2 Test procedure. Emergency responder radio coverage systems shall be tested in accordance with this section.

510.5.3.2.1 General Building Areas. General building areas shall be tested to ensure coverage is provided at a minimum of 95 percent. The test procedure shall be conducted as follows:

1. Each 100,000 square foot sector of the building floor shall be divided into a grid of 40 approximately equal areas. The maximum grid dimension shall be 50 feet, and the maximum grid size shall be 2,500 square feet.
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 and a calibrated signal level recording system. Measurements of DAQ and signal strength shall be made in each grid area.
3. Failure of a maximum of two nonadjacent test areas shall not result in failure of the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the grid resolution may be doubled, so that each 100,000 square foot sector of each floor may be divided into 160 equal areas, each having a maximum dimension of 25 feet and a maximum area of 625 square feet. A maximum of eight nonadjacent areas shall be allowed to fail the test. If the system fails the 160-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
6. Measurements shall be made with the antenna held in a vertical position at three (3) to four (4) feet above the floor. (Portable radio worn on the belt or turnout coat pocket).
7. 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.
8. When required by *fire code official* input signals may use a talkbox in accordance with NFPA 72 annex-D or similar input signal.
9. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject installation and subsequent annual inspections.
10. A sweep test to measure the level of RF radiation shall be conducted to verify that the system complies with FCC OET 65 Standards.

    Exception: FCC compliant DAS systems.

510.5.3.2.2 Critical Areas. Critical areas shall be tested to ensure 100 percent coverage. The test procedure shall be conducted as follows:

1. Each 100,000 square foot sector of the building floor shall be divided into a grid of 40 approximately equal areas. The maximum grid dimension shall be 50 feet, and the maximum grid size shall be 2,500 square feet.
2. All grids shall pass the test (failure is not an option).
3. 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 and a calibrated signal level recording system. Measurements of DAQ and signal strength shall be made in each grid area.
4. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be 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 area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.

5. Measurements shall be made with the antenna held in a vertical position at three (3) to four (4) feet above the floor. (Portable radio worn on the belt or turnout coat pocket).

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 insure spurious oscillations are not being generated by the subject installation and subsequent annual inspections.

8. When required by *fire code official* input signals may use a talkbox in accordance with NFPA 72 annex-D or similar input signal.

9. A sweep test to measure the level of RF radiation shall be conducted to verify that the antennae system complies with FCC OET 65 Standards.
   Exception: FCC compliant DAS systems.

510.5.3.2.3 Antenna Isolation. Isolation between donor antenna and the interior antenna(s) shall be measured using a spectrum analyzer. Isolation shall be at least 15 dB without the activation of anti-oscillation or automatic circuits that eliminate interference.

510.5.4 FCC compliance. The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations, including but not limited to, FCC 47 CFR Part 90.219.

510.6 Maintenance. The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through ~~510.6.3~~ 510.6.4.

510.6.1 Annual Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever 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 510.5.3.2.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load for a period of one hour to verify that they will properly operate during an actual power outage. If within the one-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one-hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing a report which shall verify compliance with Section 510.5.3.2, shall be submitted to the *fire code official*. A copy of this report shall be maintained on-site
6. The *agency* shall be notified immediately of system impairments in accordance with Appendix L..

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

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

510.6.4 Operational Maintenance. The emergency responder radio coverage system shall be maintained operational in accordance with the criteria of 510.5.3.2 at all times.

510.6.4.1 Maintenance contract. The owner is responsible for holding a maintenance contract with a company that is capable of providing emergency response 24 hours a day, 7 days a week.

510.6.4.2 Maintenance records. Maintenance records shall be maintained on-site. Copies of all maintenance records shall be submitted to SNACC, LVMPD, and the *fire code official* when requested.

Justification: These changes are made to the specific requirements for radio systems in order to ensure that the requirements for radio systems are compatible with emergency responder equipment, existing laws and ordinances.

603.1.4

603.1.4 The grade of fuel oil used in a burner shall be that for which the burner is approved and as stipulated by the burner manufacturer. Oil containing gasoline shall not be used. Waste crankcase oil shall be an acceptable fuel in Group F, M and S occupancies, when utilized in equipment listed 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.

Justification: The purpose of this revision is to make clear that the term "fuel oil" only indicates fuels intended to be used in a burner and does not apply to fuels (such as diesel) that are intended for use in an internal combustion engine. This change affects the term "fuel oil" as used throughout the code, such as Sections 603.1 and 603.3.

603.3.2

603.3.2 Fuel oil storage inside buildings. Fuel oil storage inside buildings shall comply with Section 603.3.2.1 through 603.3.2.5 or Chapter 57.

603.3.2.1 Quantity limits. One or more fuel oil storage tanks contained Class II or Class III combustible liquid shall be permitted in a building. The aggregate capacity of all such tanks shall not exceed 660 gallons (2498 L).

Exception: The aggregate capacity limit shall be permitted to be increased to 3,000 gallons (11 356 L) of Class II or III liquid for storage in protected above-ground tanks complying with Section 5704.2.9.7, when all of the following conditions are met:

1. The entire 3,000 gallon (11 356 L) quantity shall be stored in protected above-ground tanks;
2. The 3,000 gallon (11 356 L) capacity shall be permitted to be stored in a single tank or multiple smaller tanks.
3. The tanks shall be located in a room protected by an automatic sprinkler system complying with Section 903.3.1.1, with a minimum design of 0.60 gpm/ft^2 over a minimum remote area of 3,000 ft^2, using standard response sprinklers with a minimum k-factor of 11.2.

603.3.2.2 Restricted use and connection. Tanks installed in accordance with Section 603.2.2 shall be used only to supply fuel oil to fuel-burning, fire pump or generator equipment installed in accordance with Section 603.3.2.4. Connections between tanks and equipment supplied by such tanks shall be made using closed piping systems. Fuel connections and tank relief vents shall be located on the exterior of the building in approved locations.

Justification: The changes to 603.3.2.1 and 603.3.2.2 are to normalize the code from the last code cycle. In the last code cycle, terminology was added that essentially prohibited diesel fuel from being treated as fuel oil. This forced diesel fuel tanks to be subject to the more restrictive requirements of Class II liquids, and not be permitted to use some of the allowances provided for fuel oil. During this cycle, there is a move to allow some of the advantages of considering diesel fuel to be fuel oil, while adding some provisions to the fuel oil sections to address the fire hazard. The first addition is to set a minimum fire sprinkler design criteria. NFPA 30, Flammable and Combustible Liquids Code, does not have criteria for inside storage tanks containing Class II liquids, except for inside storage tank buildings. Storage tank buildings are specifically defined and require separation from other buildings and fire ratings of the storage tank building. The provisions of the IFC are seen as permitting indoor storage tanks in all types of buildings, not just storage tank buildings. In particular, a common use of the IFC provisions will be for fuel storage tanks for diesel fire pumps and emergency power generators. To address, the criteria found in Chapter 16, Table 16.5.2.2 and Table16.5.2.9, are used for guidance. Both tables indicate a design of .6/3000sf, with K-11.2 standard heads, as being used for protection of relieving-style containers of Class II liquids. The change to 603.3.2.2 is to require fill connections and vent openings to be exterior of the building. The purpose of this is to minimize fuel spills and accumulation of flammable vapors inside of a building.

606.1

606.1 Scope. Refrigeration systems shall be installed in accordance with the ~~*International*~~ *Uniform Mechanical Code*. Systems where the potential concentration of refrigerant/room volume exceeds the factors listed in Table 11-1 of the Uniform Mechanical Code shall be in accordance with this section.

Justification: The amendment bases the regulation of refrigeration systems on the potential health concerns of released refrigerant rather than the arbitrary 220 pound (100 kg) limit

606.5

606.5 Access. Refrigeration systems having a refrigerant circuit containing more than ~~220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group of refrigerant~~ the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be accessible to the fire department at all times as required by the *fire code official*.

Justification: The amendment is a companion to amendment 606.1 where the trigger for regulated systems is the allowable quantity of refrigerant per Table 11-1 of the Uniform Mechanical Code rather than the 220 pound limit

specified in the code. Table 11-1 is based on potential health effects of released refrigerant. When the allowable quantity is exceeded, the affected rooms must have sensors, alarms, horn/strobes, and emergency ventilation. It is entirely possible to have a system that contains less than 220 pounds of refrigerant yet it exceeds the allowable quantity per Table 11-1.

606.6

606.6 Testing of Equipment. Refrigeration equipment and systems having a refrigerant circuit containing more than ~~220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant~~ the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be subject to periodic testing in accordance with section 606.6.1. A written record of required testing shall be maintained on the premises. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

Justification: The amendment is a companion to amendment 606.1 where the trigger for regulated systems is the allowable quantity of refrigerant per Table 11-1 of the Uniform Mechanical Code rather than the 220 pound limit specified in the code. Table 11-1 is based on potential health effects of released refrigerant. When the allowable quantity is exceeded, the affected rooms must have sensors, alarms, horn/strobes, and emergency ventilation. It is entirely possible to have a system that contains less than 220 pounds of refrigerant yet it exceeds the allowable quantity per Table 11-1.

606.7

606.7 Emergency Signs. Refrigeration units or systems having a refrigerant circuit containing more than ~~220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant~~ the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be provided with *approved* emergency signs, charts, and labels in accordance with NFPA 704. Hazard signs shall be in accordance with the *International Mechanical Code* for the classification of refrigerants listed herein.

Justification: The amendment is a companion to amendment 606.1 where the trigger for regulated systems is the allowable quantity of refrigerant per Table 11-1 of the Uniform Mechanical Code rather than the 220 pound limit specified in the code. Table 11-1 is based on potential health effects of released refrigerant. When the allowable quantity is exceeded, the affected rooms must have sensors, alarms, horn/strobes, and emergency ventilation. It is entirely possible to have a system that contains less than 220 pounds of refrigerant yet it exceeds the allowable quantity per Table 11-1.

606.11

606.11 Storage, use and handling. Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than ~~220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant~~ the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code. Storage use or handling of extra refrigerant of refrigerant oils shall be as required by Chapters 27, 30, 32 and 34.

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.

Justification: The amendment is a companion to amendment 606.1 where the trigger for regulated systems is the allowable quantity of refrigerant per Table 11-1 of the Uniform Mechanical Code rather than the 220 pound limit specified in the code. Table 11-1 is based on potential health effects of released refrigerant. When the allowable quantity is exceeded, the affected rooms must have sensors, alarms, horn/strobes, and emergency ventilation. It is entirely possible to have a system that contains less than 220 pounds of refrigerant yet it exceeds the allowable quantity per Table 11-1.

607.1

607.1 Emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in Chapter 11. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1. No building security, access control or similar system, shall disable or override any new or existing Phase II emergency operations, preventing access to all levels.

Justification: With the concerns of employee safety in mind many companies are installing building security systems in order to control access into different areas within a building. This has been a problem for responding emergency personnel trying gain access to upper level floors by use of the elevator. The committee has knowledge of security systems stopping the use of elevators that are designed for emergency responders use in such emergencies. Without a card reader available this becomes an unnecessary delay in fire department emergency response.

609.3.5

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

Justification: Ducts for commercial cooking have a poor fire loss history. Cleaning the duct work would lessen the fire severity. The automatic sprinklers should be inspected and cleaned at the same intervals as the other components. This revision is to ensure that the access panels are provided for proper maintenance.

609.3.6

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

Justification: Ducts for commercial cooking have a poor fire loss history. Cleaning the duct work would lessen the fire severity. The automatic sprinklers should be inspected and cleaned at the same intervals as the other components. This revision is to ensure that the access panels are provided for proper maintenance.

806.1.1

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

Exceptions~~:~~

1. ~~Tress located in areas protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 shall not be prohibited in Group A,E,M, R-1, and R-2.~~
2. ~~-~~Trees shall be allowed within dwelling units in Group R-2 occupancies~~.~~

Justification: Natural cut trees (Christmas trees) present an unusual danger to occupants. The combustibility of Christmas trees is well known and due to this amendment being used over the past decade the number of fires due to Christmas trees has been reduced. Due to the dry climate in the Las Vegas valley, the fire hazard is increased over what would be experienced in other areas of the country. One and two family dwellings are exempt from this requirement.

807.1

807.1 General requirements. In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other *decorative materials* suspended from walls or ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

Exceptions:
1. Curtains, draperies, hangings and other decorative materials suspended from walls of *sleeping units* and *dwelling units* in dormitories in Group R-2 protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1 and such materials are limited to not more than 50 percent of the aggregate area of walls.
2. Decorative materials, including, but not limited to, photographs and paintings in dormitories in Group R-2 where such materials are of limited quantities such that a hazard of fire development or spread is not present.

In Groups I-1 and I-2, combustible *decorative materials* shall meet the flame propagation criteria of NFPA 701 unless
the *decorative materials*, including, but not limited to, photographs and paintings, are of such limited quantities that a hazard of fire development or spread is not present. In Group I-3, combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered *interior finish* if they cover 10 percent or more of the wall or of the ceiling area, and shall not be considered *decorative materials* or furnishings.

In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall meet the flame propagation performance criteria in accordance with Section 806.2 and NFPA 701 or shall be noncombustible. In other than Group B and M occupancies, fabric partitions shall be in accordance with the type of construction required for the building.

JUSTIFICATION: For correlation to the IBC Designers frequently want to use draperies as room dividers. The code intends room dividers to be considered interior non-bearing partitions. There are also two instances in 806 where fabric partitions are specifically allowed in Group B and M occupancies. As a partition, there is rarely any disagreement on the type of construction required by code. In addition, NFPA 701 uses a Bunsen burner as the ignition source and if a larger ignition source can be expected, the hazard may be far in excess of what Section 806 expects. This revision is only expected to clarify intent.

807.4.1

807.4.1 General. All of the following requirements shall apply to all Group A and E occupancies and Group I-4 day care facilities regulated by Sections 807.4.2 through 807.4.4:

1. Explosive or highly flammable materials. Furnishings or decorative materials of an explosive or highly flammable character shall not be used.
2. Fire-retardant coatings. 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. Obstruction. 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.

Justification: Draperies and hanging fabrics are often found to obstruct fire alarm devices. This amendment is to aid in enforcement. Visual and audible devices can be affected.

901.2.2

901.2.2 Fire Protection Reports. All high-rise, covered mall, and atrium buildings, in addition to other complex or major facilities as determined by the *fire code official*, shall have a Fire Protection Report submitted and approved prior to construction, demolition, or significant work stoppage. Fire protection reports shall be prepared by an architect or professional engineer working in their area of expertise.

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

901.2.2.2 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 the fire pump room.
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 or smoke removal system.
    Exception: For Clark County Fire Prevention, submittal is required only if the work modifies smoke control and smoke removal boundaries
12. In jurisdictions other than Clark County Fire Prevention tenant improvement and/or remodel reports are also required for all assembly, residential, high rise, covered mall, atrium and other complex or major facilities that have a previously approved FPR when required by the *fire code official*.

901.2.2.3 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 systems, 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.

901.2.2.4 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.

901.2.2.5 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*

Justification: The intent of this amendment is to codify when a fire protection report is required in accordance with current practices.

901.2.3

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

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

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

Justification: The purpose of this amendment is to establish the level of certification for system designers.

901.6

901.6 Inspection, testing and maintenance. *Fire protection systems* including ~~F~~fire detection, alarm and extinguishing systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Non-required *fire protection systems*, and equipment shall be inspected, tested and maintained or decommissioned ~~removed.~~ *Fire protection systems* installed as a required system under a previously adopted code shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Decommissioning non-required *fire protection systems and fire protection systems* installed as a required system under a previously adopted code requires the *approval* of the *fire code official.* When required, a decommissioning report and/or plans prepared by an *approved* design professional shall be submitted to the *fire code official.*

Justification: Fire protections systems shall be maintained.

901.6.2

901.6.2 Records. Records of all system inspections, tests and maintenance required by the referenced standards shall be maintained on the premises for a minimum of three years and shall be copied to the *fire code official* upon request.

Inspection reports shall mirror in form and content the most current NFPA inspection forms.

Justification: This amendment provides for consistency amongst contractors performing ITM activities and ensures that the contractors are reviewing to updated code requirements.

901.6.3

901.6.3 Authority to Audit. The *fire code official* is authorized to audit inspection, testing, and maintenance (ITM) activities as referenced in Table 901.6.1 and assess fees to cover the cost of the audit. Auditing shall be permitted to include, but is not limited to, witnessing of ITM activities, and re-inspection of systems after ITM activities have been completed.

Justification: The purpose of this amendment is to allow the *fire code official* to audit ITM activities. This is necessary due to evidence of improper ITM activities.

901.6.4

901.6.4 Contractor Licensing. Fire protection contractors/companies shall be licensed as required by the Nevada State Fire Marshal Regulations (NAC 477) and Nevada Revised Statutes (NRS). A valid Southern Nevada multi-jurisdictional business license is also required.

Justification: Informs the contractors that state and local business licenses are required to perform ITM activities.

901.6.5

901.6.5 Service Contract. A written agreement for the service of fire protection systems, including fixed fire extinguishing systems, fire alarm, monitoring, fire sprinkler and standpipe systems shall be contracted for by the owner (NAC 477.365, 477.410, 477.430, 477.465 & 477.820). For new systems, a copy of the service contract shall be provided to the *fire code official* at the time of final inspection.

901.6.5.1 Service Contract Holder Responsibilities. The company providing inspection, testing and maintenance service for fire protections systems shall comply with the all of the following:

1. Prior to the inspection, testing or maintenance of a fire protection system, the Fire Dispatch Center shall be notified by the company of the location of the test and the approximate time that the system will be out of service. Upon completion, the Fire Dispatch Center shall be notified that the system has been returned to service.
2. Perform all inspections and testing methods in accordance with applicable National Fire Protection Association (NFPA) Standards and the Nevada State Fire Marshal Regulations (NAC 477).
3. Provide a copy of the inspection report to the owner or owner's designee with 2 business days from the completion of the inspection.

4. Upon receipt of a discrepancy report, the owner shall correct such discrepancies within 30 calendar days. If the discrepancies are not corrected by the end of this 30-day period, the maintenance contractor shall submit the discrepancy report to the fire code official within 2 business days after the 30-day period expires.
5. Comply with the requirements of 901.7 whenever the testing or inspection reveals that the system has been disabled or is out of service.
6. Notify the *fire code official* in writing in accordance with NAC 477.349.
7. Comply with the requirements of sections 901.6, 901.7 and 901.9 as applicable.

Justification: The purpose of this proposal is to define when inspections records need to be sent to the AHJ. It is not effective to have all records sent to the AHJ, as there may not have been sufficient time after the inspection for the owner/occupant to correct the deficiency. By allowing 30 days from the inspection date, the owner/occupant has time to solicit bids and make necessary repairs. In addition, this proposal seeks to establish some delineation between ITM issues and systems being out of service. Where the ITM issue does not render the system out of service, the 30 days time frame is acceptable. Where the ITM issue does render the system out of service, compliance with 901.7 is necessary, which requires immediate notification to the *fire code official*.

901.9

901.9 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. ~~The *fire code official* shall be notified in writing by the building *owner* when the recalled component parts have been replaced.~~ A construction permit shall be obtained for the replacement of all recalled components.

Justification: Without a construction permit the system will not receive an inspection to verify that the replacement of recalled devices were correctly installed, hydrostatically tested, connected to the fire alarm system or monitoring device and function properly.

903.1.1

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

Justification: Also, this is an existing practice. Every area that requires fire sprinkler protection is required to have fire sprinklers. Where there is concern about sensitivity of equipment, past practice has been to have a gas suppression system, and a double-interlock fire sprinkler system as a back-up. There are certain specific places where sprinkler protection is not desired, but those are detailed in Section 903.3.1.1.1. The general exception provided by this section is not appropriate, and therefore needs to be deleted.

903.2

903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided throughout all buildings, regardless of occupancy type, including buildings built under the IRC, exceeding 5,000 sq ft (464 m^2) in building area, and additionally in locations described in Section 903.2.1 through 903.2.12. For the application of IBC Table 601 Footnote d, a required system shall be a sprinkler system that is required due to the occupancy-specific requirements of Section 903.2.1 through 903.2.12.

Exceptions:

1. Open parking garages with no other occupancy above the open parking garage structure are not required to be protected with automatic sprinklers.
2. Normally unoccupied Group U occupancies used for agricultural or livestock purposes.
3. Buildings, structures, or service equipment and installations directly used in utility generation or distribution which are installed on properly recorded easements belonging to water, gas, power, telephone, or other utility companies that are preemptively regulated by the Nevada Public Service Commission, a State of Nevada charter, or other public franchise. This exception does not apply to non-exempted buildings or structures containing occupiable spaces such as offices, meeting rooms, service counters, public restrooms, or other normally occupied spaces.

~~**Exception:** Spaces or area in telecommunications buildings used exclusively for telecommunication equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 712 of the *International Building Code*, or both.~~

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 4-hour rated fire walls with no openings constructed in accordance with the IBC.
2. Special hazard areas that require sprinklers for certain uses, such as medical gas rooms, may be fire sprinklered without requiring additional fire sprinklers, when approved by the code official.

Justification: First, the amendment calls for sprinkler protection throughout all buildings that exceed 5,000 square feet. This is the most common existing trigger point for fire sprinkler protection in the valley, and is necessary to ensure that all occupancies have a sprinkler trigger requirement. Exceptions are provided for some open parking garages and Group U occupancies

Further this change to the exception is to clear up confusion about telecommunication buildings. There is confusion on the definitions of telecommunications equipment. This exception is intended for a very specific type of buildings. However the term “telecommunication building” is not defined in the code, leading to confusion. By deleting the exception, the confusion will be eliminated. Whenever a dedicated telecommunication building, as described in NFPA 76, *Recommended Practice for the Fire Protection of Telecommunication Facilities*, is submitted, at that point the AHJ can look at the specific requirements of that submittal and decided if the deletion of fire sprinklers is warranted.

Additional requirements are added to this section to indicate that partially sprinklered buildings are not permitted. In order to sprinkler a portion of a building, separate buildings need to be created with 4-hour fire walls with no openings. This is due to the fact that NFPA 13 foresees fully sprinklered buildings.

903.2.3

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

1. ~~Throughout all~~ The Group E *fire areas* ~~that~~ have an occupant load of 50 or more. ~~greater than 12,000 square feet (1115m^2) in area.~~
2. ~~Throughout every portion of educational buildings~~ Any portion of the Group E fire areas is below the lowest *level of exit discharge.* ~~serving that portion of the building.~~
3. Rooms used for kindergarten, first or second-grade pupils or for child care purposes, are located above or below the first story.
4. Daycare facilities where there is occupancy from 12:00 AM - 6:00 AM.

> **Exception:** An *automatic sprinkler system* is not required in any area below the lowest *level of exit discharge* serving that area where every classroom throughout the building has at least one exterior *exit* door at ground level.

Justification: This amendment will cover many of the charter type or private schools that are being placed into small office buildings or churches at this time. This is an existing IBC amendment and has been a requirement for over a decade.

903.2.8

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided through-out all buildings with a Group R *fire area*.

When required by Nevada Administrative Code Section 449.211, residential facilities for groups shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2.

Justification: The Nevada Administrative Code (Health Care) requires that sprinkler systems be installed in residential facilities for groups in accordance with the requirements of the local jurisdiction. This amendment provides criteria for the style of sprinkler system to be installed. Additionally, this amendment maintains consistency with previous statutes and regulations.

903.2.11.5

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

Justification: The purpose of this amendment is to correlate the IFC with the requirements of NFPA 13. NFPA 13 requires sprinkler protection throughout the duct when the duct length exceeds 75 feet. This is due to the limitation of testing at UL, where the test apparatus is a 75 ft long duct. Due to the way that kitchens are built in this jurisdiction, there often are instances where duct lengths go for hundreds of feet. It is necessary to require additional protection for these longer ducts, as there is no evidence that the UL-approved systems can handle this duct length.

903.2.11.7

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

Justification: This change will reduce the probability of needing to retrofit the sprinkler system in storage areas when commodity classifications change because of the needs of the user. It also provides guidance to the sprinkler designer by setting a minimum protection standard. The requirement provides for sprinkler protection up to the maximum available storage height and protection for most all commodities except for plastics and rubber tire storage.

903.3.1.1.1

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

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

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

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

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

~~5.~~ 3. Fire service access elevator machine rooms and machinery spaces.

~~6.~~ 4. Machine rooms and machinery spaces associated with occupant evacuation elevators designed in accordance with Section 3008 of the *International Building Code*.

Justification: The purpose of this amendment is to eliminate sprinkler exemptions for generator/transformer rooms and for noncombustible rooms with noncombustible contents. Generator and transformer rooms warrant sprinkler protection due to fuel and electrical hazards. The noncombustible rooms warrant sprinklers because control of contents is impossible, and can be combustible over time. The remaining exemptions are based strictly on the application of water causing a hazardous condition.

903.3.1.2

903.3.1.2 NFPA 13R sprinkler systems. *Automatic sprinkler systems* in Group R occupancies up to and including two ~~four~~ stories in height shall be permitted to be installed throughout in accordance with NFPA 13 or NFPA 13R.

Justification: The purpose of this amendment is to change the scope of NFPA 13R from 4 stories to 2 stories. This is in line with state fire marshal regulations and past practices.

903.3.5.2

903.3.5.2 Secondary water supply. An automatic dedicated secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including a 100 gpm inside ~~the~~ hose stream requirement, but not less than 15,000 usable gallons, shall be provided for high-rise buildings ~~in Seismic Design Category C, D, E, or F as determined by the International Building Code~~. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes. ~~as determined by the occupancy hazard classification in accordance with NFPA 13~~.

~~**Exception:** Existing buildings.~~

903.3.5.2.1 Design options. Secondary water tanks designed as break tanks shall be designed to allow for continued fire protection when the secondary tank is taken out of service.

a. For secondary water tanks supplying horizontal split case fire pump(s), or other fire pump(s) that can take a piped water supply, a bypass shall be installed around the secondary water tank to allow for temporary supply to the fire protection system during the repair of the secondary water tank.

b. For secondary water tanks supplying vertical turbine pump(s), or other fire pump(s) that can not accept piped supply, the secondary water supply shall be split into two separate tanks, each not less than ½ of the required water capacity, interconnected by pipe with sectional valves, with redundant pumping and automatic water filling capabilities. This tank arrangement shall be such as to permit one of the two tanks to be drained and have maintenance performed, while maintaining an operational fire protection system for the building served

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

Justification: Traditionally, a secondary water supply of minimum of 15,000 gallons has been required. The IBC changes the requirement to only require 30 minutes, but then also requires the inclusion of a hose stream requirement. This is a difficult requirement, since there are many hose stream figures to choose from. For high-rise buildings, the hose stream requirement can be equal to the NFPA 14 hose demand, which would be either 750 gpm or 1000 gpm. Other interpretations of hose stream would be that required for NFPA 13 calculations, where

the inside hose stream can vary from 0 gpm to 100 gpm. Therefore, this amendment intends to clarify the hose stream requirement to be used, and also sets a minimum volume to the secondary water supply. The references to seismic areas are deleted to clarify that this requirement applies throughout the jurisdiction. The term "dedicated" is added to clarify that the secondary water supply can not be provided by other water uses, such as pools and water features.

Where the secondary water tank acts as a break tank, additional design options are provided to ensure that the fire protection system can continue to operate while maintenance is being performed on the secondary water tank. These design options provide for redundancy in the fire protection systems of high-rise buildings.

903.3.8

903.3.8 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.

Justification: This amendment is added to address industry concerns and to provide compliance with NRS 445A.6722. Systems classified as Class 4, 5, and 6 fire sprinkler systems require a reduced pressure device to protect the city supply. Reduced pressure devices are not common for fire service. The approval from the water purveyor will ensure that the device protecting the city supply is suitable for use with systems containing chemical additives, such as antifreeze.

903.4

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

Exceptions:

1. Automatic sprinklers systems protecting one- and two-family dwellings
2. Limited area systems serving fewer than 20 sprinklers.
3. Automatic sprinklers systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to ~~commercial kitchen hoods,~~ paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.

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

Justification: The purpose of this amendment is to maintain current levels of protection for commercial kitchen hoods due to the extent and size of the fire sprinkler systems that protect those systems in this valley.

903.4.1

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

Exceptions:

1. Underground key or hub valves ~~in roadway boxes provided by the municipality or public utility~~ are not required to be monitored.
2. Backflow prevention devices ~~test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.~~ located at the municipal water supply connection are not required to be monitored when either locked in the open position, or are located within an underground vault or an approved insulated enclosure.

Systems that are not electrically monitored shall have an approved identification sign below each outside horn and strobe which reads "WHEN ALARM SOUNDS – CALL 9-1-1". This sign shall be of durable material with permanent lettering having a 2-inch minimum height with ½ inch stroke on a contrasting background.

Multi-story facilities shall provide zone annunciation on a floor-by-floor basis.

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

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

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

Justification: The purpose of this amendment is to address when backflow preventer valves need to be supervised. Since the vast majority of back flow preventers in this jurisdiction actually occur in the public side of the system, this code does not apply to those valves. In many jurisdictions across the country, backflow preventers interior to the building are common. Rarely, interior backflow preventers occur in this jurisdiction. This amendment clarifies that the code applies only to those rare instances, and not to the vast majority of installations within this jurisdiction

The first deletion is to eliminate the requirement that private underground key box valves must be monitored. With this change, all underground valves are exempt from monitoring. Further, the added code section discusses additional monitoring requirements for monitored fire sprinkler systems, including how signals are to be handled.

903.4.2

903.4.2 ~~Alarms~~ Audible and Visual Notification appliances. ~~An~~ *Approved* audible ~~device, located on the exterior of the building in an *approved* location,~~ and visual notification appliances shall be connected to every *automatic*

sprinkler system. Such sprinkler water-flow alarm ~~devices~~ notification appliances shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Exterior audible and visual notification appliances shall be provided on the exterior of the building above the Fire Department Connection. One interior audible and visual notification appliance shall be provided near the main entrance. In multiple-tenant facilities, one interior audible and visual notification appliance shall be provided near the main entrance for each tenant space. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Justification: The changes made reflect changes made in the NFPA 13 adoption. The first change is to make the notification appliance audible and visual. The exterior alarm is required to be installed above the FDC, to allow suppression to find the FDC faster. Interior alarms are required for notification of someone that can take action in evacuating the building. Where multiple tenants are within the same building, then each tenant is required to have one alarm.

903.4.3

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

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to require separate fire sprinkler systems for each floor in multi-story facilities. This conforms with the current practices, and also with the adoption package for NFPA 13.

903.7

903.7 Automatic Sprinklers in Existing Buildings. Automatic sprinkler systems in accordance with Section 903 and designed per the Fire Code shall be provided in unsprinklered *existing structures* at the locations described in Sections 903.7.1 through 903.7.3.2.

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.

903.7.1 Additions. Additions to any building shall comply with this Section and Section 3403 of the International Building Code.

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

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, sprinklers are not required to be provided beyond the fire area of the addition where the addition fire area is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, and without openings.
2. In all occupancies, sprinklers are not required to be provided beyond the fire area of the addition when the addition fire area is separated from the existing building by 4-hour rated *fire walls* constructed in accordance with Section 706 of the International Building Code, and without openings.
3. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

1. The building has a total area of less than 5,000 sq ft (464 m^2) and the addition does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, the fire area containing the addition is separated from adjacent fire areas by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, and without openings.
3. In all occupancies, sprinklers are not required to be provided outside the fire area of the addition where the addition fire area is separated from existing building by 4-hour rated *fire walls* constructed in accordance with Section 706 of the International Building Code, and without openings.

903.7.2 Alterations. Alterations within existing building shall comply with this Section and Section 3404 of the International Building Code.

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

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, sprinklers are not required to be provided beyond the fire area containing the alteration where it is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, and without openings.
2. In all occupancies, sprinklers are not required to be provided beyond the fire area of the alteration when the alteration fire area is separated from the existing building by 4-hour rated *fire walls* constructed in accordance with Section 706 of the International Building Code, and without openings.
3. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

903.7.3 Change of Occupancy. A change of occupancy within an existing building shall comply with this Section and Section 3408 of the International Building Code.

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

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, sprinklers are not required to be provided beyond the fire area containing the change of occupancy where it is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, and without openings.
2. In all occupancies, sprinklers are not required to be provided beyond the fire area of the change of occupancy when the change of occupancy fire area is separated from the existing building by 4-hour rated *fire walls* constructed in accordance with Section 706 of the International Building Code, and without openings.
3. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

1. The building has a total area of less than 5,000 sq ft (464 m^2) and the change of occupancy does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, the fire area containing the change of occupancy is separated from adjacent fire areas by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707, and without openings.
3. In all occupancies, sprinklers are not required to be provided outside the fire area of the change of occupancy when the change of occupancy fire area is separated from the existing building by 4-hour rated *fire walls* constructed in accordance with Section 706, and without openings.
4. When approved by the building 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 may consider changes in occupant load, relative fire hazard and other relevant data.

Justification: The purpose of this amendment is to address how to protect new construction areas in buildings that are not currently provided with fire sprinkler protection. This amendment also is added to the Building Code amendments.

904.2 Where required. Automatic fire-extinguishing systems ~~installed as an alternative to the required automatic sprinkler systems of Section 903~~ shall be approved by the *fire code official*. Automatic fire-extinguishing systems shall not be considered ~~alternatives~~ an alternative to the required automatic sprinkler systems of Section 903 for the purpose of exceptions or reductions allowed by other requirements of this code.

Justification: The purpose of this amendment is to correlate with the deletion of IFC 903.1.1. This deletion further emphasizes that use of alternate extinguishing systems in lieu of fire sprinkler protection is not permitted.

904.11.6.2

904.11.6.2 Extinguishing system service. Automatic fire-extinguishing systems shall be serviced at least every 6 months and after activation of the system. Inspection shall be ~~by qualified individuals, and a certificate of inspection shall be forwarded to the *fire code official* upon completion.~~ conducted by personnel licensed by the State of Nevada Fire Marshal's Office and a certificate of inspection shall be kept on site and shall be readily available to the fire code official.

Justification: The amendment provides correlation with State law and clarification as to the regional requirement.

905.3.1

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

~~**Exceptions:**~~

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

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

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

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

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

~~5.1.~~ 1. Recessed loading docks for four vehicles or less, and

~~5.2.~~ 2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Justification: The required system class is changed from Class III to Class I because Class II standpipes (1.5 inch outlets with hose) are not used by any FD in Southern Nevada for firefighter safety reasons. The use of manual standpipes at the height listed in exception 2 is not allowed. By changing this section, the designer is bound to the NFPA 14 code, which requires that standpipe be automatic when the building has height of a high-rise.

905.3.3

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

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

2. At each floor-level landing within enclosed stairway 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. Throughout the entire mall building so that all portions of each floor level, including all portions of a tenant space, 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 along normal walking routes, and the stream shall not be expected to penetrate walls or windows. ~~At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.~~

Justification: The amendment to item 5 is to address spacing of hose connections. This amendment takes into account hose length available in high-rise packs. This amendment correlates operational tactics and equipment used by valley fire departments. Typical hose packs include 100 feet of hose, and due to nozzle physics water is intended to spray 30 feet.

905.3.9

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

Justification: This amendment will allow operations staff to have sufficient standpipe coverage in a large facility that otherwise may not have to provide a standpipe system. The typical operational pre-connect length is 200 feet.

905.4

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 stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located ~~at an intermediate floor level landing between floors, unless otherwise approved by the *fire code official*.~~ on the floor landing, as approved by the authority having jurisdiction.
2. On each side of the wall adjacent to the exit opening of a horizontal exit
   Exception: Where floor areas adjacent to a horizontal exit are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal exit.
3. In every exit passageway, at the entrance from the exit passageway to other areas of a building.
   Exception: Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.
4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), each standpipe shall be provided with a hose connection located to serve the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.16.
6. 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 along normal walking routes, and the stream shall not be expected to penetrate walls or windows. ~~Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in approved locations.~~

Justification: The amendment to item 1 is to require that hose valves be located inside the stair, in accordance with consensus valley wide Fire Department high rise procedures. The amendment to item 6 is to address spacing of hose connections. This amendment takes into account hose length available in high-rise packs. This amendment correlates operational tactics and equipment used by valley fire departments. Typical hose packs include 100 feet of hose, and due to nozzle physics water is intended to spray 30 feet.

905.4.1

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

Exception: In buildings constructed of Type I or Type II construction in accordance with the Building Code or in buildings equipped throughout with an approved automatic sprinkler system, standpipes ~~laterals~~ that are not located within an enclosed stairway or pressurized enclosure are not required to be enclosed within fire-resistance-rated construction.

Justification: The intent of this amendment is to clarify what piping must be protected. The base NFPA 14 language may be read to require protection for the feed mains of the standpipe system. However, the IFC clearly allows for exemption of protection for all lateral piping. The feeling is that for sprinklered buildings, protection of lateral piping is not necessary. Vertical risers are also not required to be protected by this amendment. These exceptions apply when the building is built of noncombustible construction or when sprinklers are provided. It is noted that there is no requirement for piping protection set forth in NFPA 13.

905.5

905.5 Location of Class II standpipe hose connections. Class II standpipe hose connections shall be accessible and shall be located ~~so that all portions of the building~~ where required by Section 905.5.1. Hose connections shall be provided so that all areas described in Section 905.5.1 are within 30 feet (9144 mm) of a nozzle attached to 100 feet (30 480 mm) of hose.

Justification: The purpose of this amendment is to clarify that when Class II hose connections are required, such connections are required for coverage only in the specific area where required. This is to alleviate issues with the base code, which can be interpreted to indicate that such connections are required throughout a building.

905.5.3

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

Justification: The intent of this amendment is to remove the option to allow hose down to 1-inch. There are concerns with the deliverable flow rates, and the required residual pressures, for 1-inch hose. As such, this amendment removes the option of using 1-inch hose.

905.9

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

Exceptions:

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

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

Justification: The first exception is revised, similar to the revision for 903.4, so that no underground valves require monitoring. The second exception is deleted to ensure that all valves on the system are monitored.

906.2

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

Exceptions:

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

Justification:

This amendment is required to correlate with State Fire Marshal regulations and NAC 477 regarding interval for fire extinguisher maintenance.

907.1

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. An integrated campus system shall not supplant the fire alarm system requirements in new buildings and structures. Supplemental integrated campus systems may be allowed subject to the approval of the

fire code official. When approved by the *fire code official* supplemental integrated campus systems circuits shall utilize class A, style 7, weatherproof raceway and wiring methods.

Justification: This amendment clarifies that the requirements of this section apply to each building and structure independently. Campus systems cannot be used to serve as the required system in a building or structures. Campus systems are problematic due to ground faults, breaks in wiring, and multi-building failures.

907.1.2

907.1.2 Fire alarm shop drawings. Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation. Where the installation changes from the approved shop drawings, corrected shop drawings showing the system as actually installed shall be submitted for review and approval prior to inspection. Shop drawings ~~, and~~ shall include~~, but not be limited to, all of~~ the following as required by the *fire code official*:

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

1. Project name, street address and owner's name.
2. Contractor name, address, phone number, license numbers, license classification, and license limit.
3. Wet/electronic signature of licensee (contractor's Master or Qualified Employee).
4. Wet/electronic signature of the NICET designer or Nevada Registered Fire Protection Engineer who prepared the plan, drawing and calculations. For plans prepared by a NICET designer, the designer's printed name and certificate number shall follow the signature.
5. Occupancy classification. For all occupancies, state the occupant load.
6. Fire alarm circuit classification (power-limited or non-power-limited).
7. Class designation of all initiating device circuit (IDC), signaling line circuits (SLC), and notification appliance circuits (NAC).
8. Conductor type and size.
9. Sequence of operation input/output matrix as required by NFPA 72.
10. Symbol legend with equipment description (manufacturer's name and model number) and mounting description (surface, semi-flush, flush, and exterior).
11. When required by the *fire code official* symbols used on the shop drawings shall follow the most current edition of NFPA 170..
12. Site plan.

13. Floor plan drawn to an indicated scale (1/8" minimum) on sheets of a uniform size showing:
    a. Point of compass (north arrow).
    b. A graphic representation of the scale used on all plans.
    c. Walls, doors, windows, openings, stairs, elevators, passageways, high piled storage racks, etc., as applicable to depict the facility.
    d. Room use identification labels.
    e. Alarm initiating device, notification appliance, and auxiliary controlled or monitored equipment and systems, control and annunciation equipment location (s).
    f. Conductor/conduit routing and size.
    g. Location of end-of-line resistors.
    h. Zone identification (conventional system).
    i. Device addresses (addressable systems).
    j. Notification appliance numbering by circuit and device corresponding to the riser and/or one line diagrams.
    k. Power panels and circuit connections.
    l. Key plan.
    m. Ceiling heights, and construction (i.e., beam, joist, soffit, or other projection extending below the ceiling when a ceiling mounted device and/or appliance is used).
14. Mounting height detail for wall mounted device and/or appliance.
15. Riser diagram including the following information:
    a. General arrangement of the system, in building cross-section.
    b. Wall/shaft/stairwell and/or cable ratings when survivability or class A requirements apply.
    c. Type and number of circuits in each riser.
    d. Type and number of fire alarm system components/devices on each circuit, on each floor or level.
16. Emergency voice/alarm communication system plans shall: graphically and in tabular form designate acoustically distinguishable spaces; indicate where intelligibility testing is required and where intelligibility testing is not required.
17. *Fire code official* standard shop drawing notes.
18. Standardized calculations (shown on the plans unless otherwise approved):
    a. Battery (all panels).
    b. Load (all notification appliance and auxiliary circuits).
    c. Voltage drop (all notification appliance circuits, including remote annunciators and auxiliary appliances).
    d. Speaker power loss calculations
19. Addressable device list with *approved* alpha numeric descriptor for each device when required by the *fire code official*
20. Product data submittal including a cover index sheet listing products used by make and model number, manufacturer data sheets and listing information for all equipment, devices, materials, wire and cable.
21. Design number and detail of penetration fire stop system when required.
22. Any additional information determined necessary by the *fire code official*.

Justification: This amendment provides much greater detail than the base code on the information that needs to be provided on fire alarm shop drawings. The use of fire protection symbols outlined in NFPA 170 provides consistency. Nevada State Regulations (NRS) 477 require installers to submit and receive approval for their revised shop drawings showing as-build field changes prior to inspection. Revising the language from authority having jurisdiction to *fire code official* is consistent with the language of the IFC.

907.1.4

907.1.4 Signage. A "FIRE ALARM CONTROL PANEL" sign shall be provided in minimum 2" letters with a minimum ½" 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*.

Justification: The addition of a signage requirement assists first responders in being able to locate the fire alarm control panel(s).

907.2

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.

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

Exceptions:

1. ~~1.~~ The manual fire alarm box ~~is not required~~ shall not be installed for fire alarm systems dedicated to elevator recall control and supervisory service~~.~~ and fire sprinkler monitoring systems.
2. ~~The manual fire alarm box is not required for Group R-2 occupancies unless required by the *fire code official* to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.~~

Justification: The international fire code commentary and building code commentary indicate that the requirements of Section 907.2 do not specifically state that the systems must be installed and maintained throughout buildings, only in the fire area that contains the occupancies. The amendment adds clarity by identifying the extent of the area receiving the fire alarm/detection system as the "fire area". Fire area is the aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or horizontal assemblies of a building. Buildings that have more than one occupancy and do not contain more than one fire area are identified as non-separated mixed-use buildings. A non-separated mixed-use building that contains one fire area that requires a fire alarm/detection system is required to have the system extended throughout the building in accordance with the International Building Code.

The three story fire alarm requirement is added for correlation with the NRS.

The change to exception 1 is an accepted practice in Southern Nevada. Local fire officials do not want pull stations installed for dedicated function fire alarm systems such as elevator recall systems and sprinkler monitoring systems. Not only is the pull station unnecessary for these types of systems, it also may cause confusion with someone thinking that a code-compliant fire alarm system is installed when there is none installed.

The reason to delete exception 2 is to coordinate with a previously approved IFC amendment to Section 907.2.9.1.

907.2.1

907.2.1 Group A.

A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more or is more than 100 persons above or below the lowest *level of exit discharge*. Group A occupancies not separated from one another in accordance with Section 707.3.9 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

> **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.

Justification: Group B occupancies in the International Fire Code currently require the installation of a fire alarm system when the occupant load is more than 100 person above or below the lowest level of exit discharge. Adding this same criterion to Group A occupancies is consistent with the increased risk associated with a people intensive place of assembly use.

907.2.3.1

907.2.3.1 Locking manual pull stations. When buildings are protected throughout by an approved automatic sprinkler system, manual pull stations are allowed to be of the institutional type devices in areas normally occupied by students, subject to the following conditions:

1. Approval of the *fire code official* shall be obtained prior to any conversions or installation. The Key operated devices shall be a listed "institutional" type and not a field modified device.
2. All school staff members shall be trained in the operation of the key operated devices and shall receive a key with obvious markings, for operating the manual pull station. Staff members shall have their key at all times while on school property.
3. The school official shall collect training reports verifying that staff has had training on a quarterly basis and shall be available for review by the *fire code official* upon request.

4. The Fire Department may conduct unannounced drills or training.

5. Unacceptable performance as evaluated by the f*ire code official* may result in a requirement to convert the devices back to traditional type.

Justification: This has been a request by CCSD to allow the installation of such devices. This has been an amendment for many code cycles. This proposal helps to minimize the amount of false activations that may occur within schools.

907.2.7.1

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

Justification: This code section was also deleted in the Southern Nevada Amendments to the 2009 IFC. This section doesn't take into account the notification of hearing-impaired people that may be in mercantile occupancies. The committee also felt that such a delay in notification is unjustifiable.

907.2.8.2

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* doors opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

Justification: The change is to add the definition of "interior". There is debate that goes on about the use of smoke detectors in nonconditioned spaces. This language is added to clarify that smoke detector protection is not required in interior corridors that are not conditioned.

907.2.9.1

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

1. Any *dwelling unit* or *sleeping unit* is located three or more stories above the lowest *level of exit discharge*;
2. Any *dwelling unit* or *sleeping unit* is located more than one story below the highest *level of exit discharge* of *exits* serving the *dwelling unit* or *sleeping unit*; or
3. The building contains ~~more than 16~~ 15 or more *dwelling units* or *sleeping units*.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
   2.1 At least one manual fire alarm box is installed at an approved location.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means or egress door opening directly to the exits or are served by open-ended corridors designed in accordance with Section 1026.6, Exception 4.

Justification: The reason to add the requirement for installing at least one pull station is because NFPA 72 requires at least one to be installed for buildings with sprinkler systems and because the other residential occupancies that require fire alarm systems and have sprinklers installed require at least one pull station per the IFC.

The revision from “more than 16 units” to “15 or more units” is to coordinate with Nevada State requirements.

907.2.9.1.1

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 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 doors opening directly to an exit or to an exterior exit access that leads directly to an exit.

Justification: This is a requirement for R-1 occupancies, so it should also be applied to R-2 occupancies, which are similar in nature. It’s very important to provide early alerting to occupants who may be asleep at the time of the fire.

It is important to provide equal protection in R-2 occupancies due to local uses of R-2 buildings. Many such buildings are designed for non-transient use, but are used in a transient manner.

The change is to add the definition of "interior". There is debate that goes on about the use of smoke detectors in nonconditioned spaces. This language is added to clarify that smoke detector protection is not required in interior corridors that are not conditioned.

907.2.13

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

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
3. ~~Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.~~
3. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.
5. ~~Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *International Building Code*.~~
6. ~~In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the emergency voice/alarm communication system.~~

Justification: This amendment clarifies what buildings are exempted from high-rise building requirements for fire alarm systems.

907.2.13.1.1

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

1. In each mechanical equipment~~, electrical, transformer, telephone equipment~~ or similar room which is not provided with sprinkler protection.
2. In each elevator machine room and in elevator lobbies.
3. In each, transformer, telephone equipment and information technology equipment room.
4. In each electrical room (i.e., a room designed and dedicated to electrical distribution).

Exception: Mechanical equipment and similar rooms containing electrical equipment necessary for the operation of that equipment, such as motor control centers, variable frequency drives, service disconnects, building automation controls, and other similar electrical equipment are not required to be provided with smoke detection.

Justification: Previous national codes (the UBC and UFC, for instance) have required smoke detectors to be located within electrical and similar type rooms. Local fire codes have also required smoke detectors to be installed in these locations. Providing smoke detection within these types of rooms, even when the rooms have been provided with sprinkler protection, offer significant benefits. Early detection of a fire in these rooms could offer the benefit of being able to extinguish the fire and/or shut off power before the sprinkler system could activate. This would minimize the damage both to the building and to the electrical components located within the room.

Furthermore, these rooms, due to the nature of the contents, can be subject to smoldering fires. Smoldering fires are characterized by a large production of smoke accompanied with low heat release rates. These fires can be detected much quicker than by a sprinkler response.

Past history has shown that nuisance alarms have not been an issue when smoke detectors are located within these types of rooms. These rooms where the smoke detectors are to be installed are typically relatively clean environments and are not accessible to the public.

Also, please note that this code section applies only to high-rise structures, where early detection of a fire is critical to both building occupants and to first responders.

907.2.13.1.3

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 AHJ.

Justification: This has been an adopted amendment for two code cycles for some of the local jurisdictions. Stand alone smoke alarm devices rely on either the person in the room of fire origin or someone hearing the device and calling for staff response. This delay in time will increase risk of injury or death to the tenant and substantial damage to the space as this time delay may allow the fire to grow to a level that sprinkler activation(s) has occurred. The activation of a system type smoke detector will allow timely, accurate notification to responding staff and staff won't have to rely on any outside interaction to start response. Even if sprinkler activation has occurred, these devices could also minimize water damage during a fire event that activates the sprinkler system since the exact location of the fire would immediately be known

With the current arrangement of installing stand alone smoke alarms, there is no way of determining that the device has been removed since the stand alone device is not supervised. If these devices were installed, staff would be alerted immediately that a device has been removed.

Another benefit is that these devices would be powered by both normal and emergency power, thereby increasing reliability of these detectors.

Another advantage is in the maintenance and testing of these devices. These devices will produce a trouble when they're dirty, increasing both the reliability and functionality of the detectors. A log will also be produced within the fire alarm control unit and will print out when the detectors have been tested, thereby producing a documented test of the detectors.

The word “new” is added to clarify that this requirement does not apply to remodels of existing buildings, but rather to new construction or to total replacements of fire alarm systems.

907.2.13.2

907.2.13.2 Fire department communication system. Where a wired communication system is provided in addition to ~~*approved* in lieu of~~ a radio coverage system in accordance with Section 510, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 using warden stations and shall operate between a *fire command center* complying with Section 508, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed *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 enclosed *exit stairway*.

Justification: This amendment is made so it is clear that a wired system can not be used in lieu of a radio system. Since responding personnel will expect radio systems, any wired systems shall require warden stations. Warden stations address incompatibility of different phone jacks with the different fire alarm manufacturers.

907.2.13.3

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

Justification: It’s common policy for high-rise buildings to evacuate only the floor of alarm, the floor above the alarm, and the floor below the alarm. A fire alarm system that has multiple channels allows one area of the building to receive an evacuation message, while other areas of the building can be given other instructions.

907.2.13.4

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 A wiring methods. The outgoing and return conductors shall not be run in the same cable assembly, enclosure, or raceway.

Justification: The purpose of this amendment is to provide a layer of redundancy for networked fire alarm systems. This allows all nodes to successfully communicate with each other even with an open circuit. Given the size and complexity of the high-rise buildings in Southern Nevada this redundancy is critical for life safety systems.

907.2.24

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

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

Justification: The NRS/NAC used to have requirements for child-care facilities that included a requirement for smoke detection in sleeping/mapping areas. These detectors provide a quicker response to caregivers to facilitate safe egress of children.

907.3.1

907.3.1 Duct smoke detectors. Smoke detectors installed in ducts shall be *listed* for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is provided ~~required by Section 907.2~~. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal ~~at a constantly attended location~~ 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 *Uniform Mechanical Code*. Duct smoke detectors shall not be used as a substitute for required open area detection.

~~**Exceptions:**~~

1. ~~The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.~~
2. ~~In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.~~

Justification: This is an attempt to correlate with amendments made to NFPA 72 regarding duct detectors sending supervisory instead of alarm signals. The reason to delete exception number 2 is an established past practice of several of the jurisdictions in the valley. It's felt that since duct detectors are not considered to be life safety devices, and because the fire departments do not respond to duct detector troubles or alarms, it's unnecessary to require separate notification for them. The owner could choose to install them if so desired for convenience sake. This amendment occurs only in the fire code and the net effect will be that the fire code deals only with duct detectors tied to fire alarm systems. Single station detectors will still be required to comply with the IBC requirements.

907.4.1

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

Exceptions:

1. Where ambient conditions prohibit installation of smoke detector, a heat detector shall be permitted.
2. Dedicated function fire alarm systems shall not have smoke detectors installed.

Justification: The intent of this amendment is to clarify to indicate that automatic smoke detection is not required to be added to protect dedicated function fire alarm system panels.

907.4.2

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.

Justification: Locally, manual fire alarm boxes have been found to be used to initiate a nuisance/false alarm. Dual action pull stations are engineered to require a two step process to initiate an alarm which may help reduce the number of nuisance/false alarms.

907.5.2.1.1

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

(1) Audible notification devices shall be installed in each occupied area, including but not limited to spaces such as all bathrooms, walk-in closets greater than 100 sf., storage rooms greater than 100 sf., and walk-in coolers/freezers greater than 100 sf.

(2) In lieu of providing audible notification devices within certain spaces, calculations may be performed in order to prove that the alarm signals from the proposed adjacent audible devices will achieve a minimum of 80 decibels inside and throughout that space, where doors or other barriers between the space and the adjacent audibility device(s) are closed.

Justification: This is an attempt to correlate with the NFPA 72 amendment. The justification this section is that the 80 decibel requirement has been an accepted standard throughout the State of NV for many years, and simplifies audibility testing. The reason to have audibility devices installed in each occupied space is because of the decibel drops that occur once a door is closed if no device is installed within a space. Real world testing indicates that when doors are closed and there is no audible device installed within a space, then achieving the minimum of 80 decibels is often not possible. This issue typically comes up at the very end of the job, when a facility is attempting to get a C of O. Requiring an audible device within each space should help eliminate these last minute issues, and also ensure compliance with the minimum audibility requirements.

907.5.2.1.1.1

907.5.2.1.1.1 Where occupants are incapable of evacuating themselves because of age, physical or mental disabilities, or physical restraint, the private mode as described in NFPA 72, National Fire Alarm Code, may be permitted to be used when allowed by the *fire code official*. Only the attendants and other personnel required to evacuate occupants from a zone, area, floor, or building shall be required to be notified when allowed by the *fire code official*. The notification shall include means to readily identify the zone, area, floor, or building in need of evacuation.

Justification: This is an attempt to correlate with the NFPA 72 amendment. This amendment allows the AHJ the flexibility to modify the audibility requirements for certain institutional occupancies because it may be more harmful that advantageous to provide the full 80 decibels. For example, do we really want prisoners who are unable to leave their cells to have to listen to potentially very loud alarm signals? This may cause security problems, and may cause prisoners to "freak out". Another example would be for an area of a hospital that caters to Alzheimer's patients. Do we really want them to be potentially confused and maybe panic from the alarm signals?

907.5.2.1.2

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

Justification: The reason to still require audible notification is because there still may be situations where having such notification will be useful. For instance, if the average ambient noise can be reduced via various shutdown methods, then the audible notification could still be useful.

907.5.2.3

907.5.2.3 Visible Alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.4.

Exceptions:

1. Visible alarm notification appliances are not required in alterations~~,~~ when the building does not have visible devices installed anywhere within the building, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in exits as defined in Chapter 2.
3. Visible alarm notification appliances shall not be required in elevator cars.

Justification: This is a past practice of several of the local jurisdictions. It is not unreasonable to require visible alarm notification appliances within alterations when a building already has visible notification devices installed in other areas of the building.

907.5.2.3.1

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

Exceptions:

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

Justification: This is similar to an existing IFC amendment. This amendment is to clarify where strobes are not required to be installed. These exceptions are also given in the NAC.

907.6.3.1

907.6.3.1 ~~Zoning indicator panel.~~ Alarm Annunciator and Fire Alarm Control Unit. ~~A zoning indicator panel and the associated controls shall be provided in an approved location. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible alarm silencing switch.~~ 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.

Justification: This amendment updates the code language used for the annunciation of fire alarm signals. It clarifies the need for accessibility by emergency responders. It further states that the fire alarm control unit shall be installed within the fire riser room, and that annunciation is required at the front entrances to multi-story buildings.

907.6.5

907.6.5 Monitoring. Fire alarm systems required by this chapter or by the IBC shall be monitored by an approved supervising station in accordance with NFPA 72 and with the *fire code official* guidelines. 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, with NFPA 72, and with the *fire code official* guidelines.

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

1. Single- and multiple station smoke alarms required by Section 907.2.11.
2. ~~Smoke detectors in Group I-3 occupancies.~~

~~3.~~2. Automatic sprinkler systems in one- and two-family dwellings.

~~4.~~3. Manual fire alarm systems, when provided with approved signs in the following locations: directly below the horn and strobe located on the exterior of the building and adjacent to each manual pull station. The signs shall read as follows: WHEN ALARM SOUNDS - CALL 911. The signs below the horns and strobes shall be of durable material with permanent lettering having a 2" minimum height and minimum ½" stroke on a contrasting background. The sign adjacent to each pull station shall be of durable material with permanent lettering having a ¼" minimum height on a contrasting background.

4. Monitoring systems utilizing point-by-point monitoring.

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

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

The supervising station shall only retransmit Water Flow Alarm signals to the Fire Department, unless otherwise required by the *fire code official*.

Justification: Self-monitoring is permitted by Southern Nevada jurisdictions to reduce the number of false alarms. The reason to not allow the items listed as exceptions to be able to provide monitoring is in order to greatly reduce the number of false alarms that would be sent to the monitoring facilities. .

907.6.5.3

907.6.5.3 Supervising Stations. A permit is required when the following occurs:

1. Supervising station adds a new monitoring subscriber.

2. Supervising station changes services or transfers accounts for an existing subscriber. For example, a new tenant or building owner utilizing the same supervising station.

Supervising stations shall not provide monitoring services for a subscriber until final acceptance and approval is granted by the *fire code official*.

Supervising stations shall not transfer accounts without notification to the Fire Department. Notification must be received in writing within 30 days of transfer.

In the event a monitoring contract is terminated, canceled or not renewed, the *fire code official* shall be notified in writing within 24 hours.

A current UL or FM Central Station Certification shall be provided on an annual basis.

Supervising stations shall annually provide documentation of runner service. Runner service shall be in accordance with UL 827.

Justification: To provide criteria for when a construction permit is required. A permit is necessary to confirm that the supervising station is using the correct address, phone numbers for dispatch and signals being monitored.

907.6.6

907.6.6 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.

Justification: Having multiple main or master panels typically create problems such as having to reset multiple panels during an alarm condition. Issues of compatibility also often present itself when interfacing multiple panels. Maintaining proper supervision of the related circuiting also often becomes an issue with multiple panels.

907.6.7

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*.

Justification: This amendment prevents using the fire alarm panel as a burglar alarm system or building maintenance system (BMS). This amendment helps to ensure the integrity of fire alarm systems.

907.6.8

907.6.8 Secondary Response Point. A Secondary Response Point (SRP) shall be provided in accordance with this section.

907.6.8.1 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.

907.6.8.2 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.

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

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

Justification: Due to the size of special projects that require the installation of a Fire Command Center, it may be counterproductive to take the time to access the Fire Command Center, as access directly to the main building entrance may be more available.

907.8

907.8 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with Sections 907.8.1 through 907.8.5 and NFPA 72.

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

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

Prior to service or testing of any equipment, the Fire Department's Dispatch Center shall be notified of the location of the test and the approximate time that the equipment will be inoperable. Upon the completion of the test and inspection, the Fire Department Dispatch Center shall be notified that the system is operable.

In the event a service/maintenance contract is canceled or not renewed, the *fire code official* shall be notified by the service company within 24 hours.

Justification: This amendment is similar to an existing amendment within the Southern Nevada amendments to the IFC. The purpose of this amendment is to clarify local requirements for the inspection, testing and maintenance of fire alarm systems.

907.10

907.10 Fire Alarm Systems in Existing Buildings. Fire alarm systems, installed in accordance with Section 907 and the Fire Code, shall be provided in *existing structures* at the locations described in Sections 907.10.1 through 907.10.3.

907.10.1 Additions. Additions to any building shall comply with this Section and Section 3403 of the International 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.

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, fire alarm system coverage is not required beyond the fire area containing the addition where the addition fire area is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, with openings protected with automatic-closing devices.
2. In all occupancies, the addition of a *Fire Wall* in accordance with Section 706 of the International Building Code, with openings protected with automatic-closing devices, may be used to create a new fire area that separates the addition from the remainder of the building. The *Fire Wall* may either:
   a. limit required fire alarm system coverage to include only the new fire area containing the addition, or
   b. limit required fire alarm system coverage to include the new addition and other existing spaces adjacent to the addition that remain in the same fire area, or
   c. eliminate the requirement to install a fire alarm system in accordance with the provisions of Section 907.2.

907.10.2 Alterations. Existing buildings that undergo an alteration shall comply with this Section and Section 3404 of the International 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.

> **Exceptions:**
>
> 1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, 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* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, and with openings protected with automatic-closing devices.
> 2. In all occupancies, the addition of a *Fire Wall* in accordance with Section 706 of the International Building Code, with openings protected with automatic-closing devices, may be used to create a unique fire area to separate the alteration from the remainder of the building. The *Fire Wall* may either:
>   a. limit required fire alarm system coverage area to include only the fire area containing the alteration, or
>
>   b. eliminate the requirement to install a fire alarm system in accordance with the provisions of Section 907.2.

907.10.3 Change of Occupancy. Existing buildings that undergo a change of occupancy shall comply with this Section and Section 3408 of the International Building Code.

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

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

> **Exceptions:**
>
> 1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, 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* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, with openings protected with automatic-closing devices.
> 2. In all occupancies, the addition of a Fire Wall in accordance with Section 706 of the International Building Code, with openings protected with automatic-closing devices, may be used to create a unique fire area to separate the portion of the building containing the change of use from the remainder of the building. The Fire Wall may either:

a. limit required fire alarm system coverage area to include only the fire area containing the change of use, or
b. eliminate the requirement to install a fire alarm system in accordance with the provisions of Section 907.2.

Justification: The purpose of this amendment is to address how to protect new construction areas in buildings that are not currently provided with fire alarm protection. This amendment also is added to the Building Code amendments.

908.8

908.8 When an emergency alarm system is interfaced with a building's fire alarm system. When an emergency alarm system is interfaced with a building's fire alarm system, the signal produced at the fire alarm control unit shall be a supervisory signal.

Justification: The code is silent on what signals shall be produced on fire alarm control units when emergency alarm systems are interfaced with a building's fire alarm system. This proposal clarifies the type of signal that needs to be produced. A supervisory signal is most appropriate because we don't want to necessarily evacuate the building due to an emergency alarm system activation, but we do want this signal to be a higher priority than just a trouble signal.

909.5.2

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

Exceptions:

1. *Unchanged*
2. *Unchanged*
3. *Unchanged*
4. *Unchanged*
5. *Unchanged*
6. Door openings in *smoke barriers* shall be permitted to be protected by *self-closing* fire doors in the following locations:

   6.1 Guest rooms.

   6.2 Individual dwelling units.

   6.3 Mechanical rooms.

   6.4 Elevator machine rooms.

6.5 Electrical rooms used exclusively for that purpose.

6.6 Doors typically maintained in a closed position as approved by the Building Official.

Justification: IBC Correlation

909.16

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

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

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

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

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

~~**Exceptions:**~~

1. ~~Complex systems, where approved, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit~~
2. ~~Complex systems, where approved, where control is accomplished by computer interface using approved, plain English commands.~~

~~**909.16.3 Control action and priorities.** The fire fighter's control panel actions shall be as follows:~~

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

~~**Exception:** Power disconnects required by NFPA 70.~~

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

909.16.1 Smoke control systems. The fire-fighter's smoke control panel shall be designed in accordance with the *fire code official's* guidelines.

909.16.2 Smoke control panel. The fire-fighter's smoke control panel shall be designed in accordance with the *fire code official's* guidelines.

909.16.3 Control action and priorities. The fire-fighter's smoke control panel shall be designed in accordance with the *fire code official's* guidelines.

Justification: Coordination with the proposed IBC amendments. Locally, the fire officials are the ones who review these types of panels. Each jurisdiction maintains their standards for design of these panels, so this amendment points to those criteria.

909.17

909.17 System response time. Smoke-control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. For purposes of smoke control, the fire-fighter's smoke control panel response time shall be the same for automatic or manual smoke control action initiated from any other building control point. The total

response time, including that necessary for detection, shut-down of operating equipment and smoke control system startup, shall allow for full operational mode to be achieved before the conditions in the space exceed the design smoke condition. ~~The system response time for each component and their sequential relationships shall be detailed in the required rational analysis and~~ Upon receipt of an alarm condition at the fire alarm control panel, fans, dampers and automatic doors shall have achieved their proper operating state and final status shall be indicated at the smoke control panel within 90 seconds. ~~v~~ Verification ~~of their installed condition~~ shall be reported in the required final report.

Justification: **Correlation with the IBC.**

909.18.8.3

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

> I have reviewed this report and by personal knowledge and on-site observation certify that the smoke-control system is in substantial compliance with the design intent, and to the best of my understanding complies with requirements of the code.

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

Justification: Correlation with the IBC.

909.18.10

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.

Justification: Correlation with the IBC

909.20

909.20 Maintenance. Smoke control systems shall be maintained in an operable condition at all times to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. ~~The system shall be maintained in accordance with the manufacturer's instructions and Sections 909.20.1 through 909.20.5.~~

Inspection and periodic testing of existing smoke control systems shall be performed in accordance with the Southern Nevada Fire Code Committee's Uniform Guideline for smoke control testing & recertification, the manufacturer's instructions and Sections 909.20.1 through 909.20.5.

Justification: This amendment refers the users to smoke control testing and recertification guidelines that have been approved by local fire code officials.

909.20.4

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

Justification: This amendment provides the fire code official flexibility in whether to require if and to what extent testing of smoke control systems must be conducted under standby power conditions.

909.20.5

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

Justification: This amendment provides the fire code official flexibility in whether to require if and to what extent testing of smoke control systems must be conducted under standby power conditions.

910.3.1

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

Justification: Correlation with IBC and errata, code section is in the IBC and is not printed in the IFC.

910.3.2

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

Justification: Correlation with IBC and errata, code section is in the IBC and is not printed in the IFC.

910.3.2.1

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

Justification: Correlation with IBC and errata, code section is in the IBC and is not printed in the IFC.

910.3.2.2

910.3.2.2 Sprinklered buildings. Where installed in buildings equipped with an approved automatic sprinkler, smoke and heat vents shall be designed to operate automatically by actuation of a heat-responsive device rated at a minimum temperature of 360° F (182° C).

Justification: Correlation with the IBC and errata, section is printed in the IBC but not in the IFC. Change to IBC language is to specify how to automatically activate vents in sprinklered buildings, as no guidance is provided in the base code. It is important to ensure that vents do not open prior to activation of the sprinklers, as loss of heat can cause a detrimental effect on the effectiveness of the sprinkler system. FM guidelines indicate one of two methods. One method is to specify the minimum temperature of 360° F (182° C), and the other method is to require the link temperature to be one rating higher than the sprinkler temperature. Of the two, the method with the fixed temperature is easier to enforce, so that is the method chosen here. It is worthwhile to note that previous adopted codes required the link rating to be between 350 ° F and 400 ° F; as such, the 360° F used in this proposal is appropriate and in keeping with past practice.

910.3.2.3

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

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

Justification: Correlation with IBC and errata, code section is in the IBC and is not printed in the IFC.

910.3.3

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

Justification: Correlation with IBC and errata, code section is in the IBC and is not printed in the IFC.

910.3.5

910.3.5 Draft curtains. Where required by Table 910.3, draft curtains shall be installed only in non-sprinklered buildings on the underside of the roof in accordance with this section.

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

Justification: Correlation with the IBC. This amendment is intended to provide consistency for regional application of code. The purpose of this amendment is to not require draft curtains in buildings protected with fire sprinklers. The basis of this amendment is from Section 12.1.1 of NFPA 13.

Since NFPA 13 does not provide sprinkler design criteria that encompass the use of draft curtains, then the requirement for draft curtains needs to be exempted for buildings protected in accordance with NFPA 13.

912.3.2

912.3.2 Clear space around connections. A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height 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 chief~~ *fire code official.*

Justification: The base code language does not give much direction to where the devices can be located. Operationally, having the FDC too close to an opening may block ingress or exiting from a building.

913.1.1

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

Justification: The purpose of this amendment is to require redundant fire pumps for tall buildings. The purpose of this is to ensure reliability in the building. The fire pump is vital in high-rise buildings, so providing a redundant pump is important in order to ensure that the fire pump capacity is maintained.

913.1.2

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

Justification: The purpose of this amendment is to require redundant fire pumps when multiple buildings are serviced by one fire pump system. The purpose of this is to ensure reliability for buildings not intimately involved with a fire scenario. Where required, the fire pump is vital for protection of buildings, so providing a redundant pump is important in order to ensure that the fire pump capacity is maintained. If a single pump is used and fails during a fire, although only one building is damaged from the fire, all of the buildings would lose protection due to the failed fire pump. Providing a redundant pump helps to avoid this situation.

913.2.1

913.2.1 Protection of pump rooms. Rooms where fire pumps are located shall be separated from all other areas of the building ~~in accordance with Section 913.2.1 of the International Building Code.~~ with 2-hour rated walls and ceilings.

Exception: Where the pump is housed in a room that is 50 feet or greater from the building being protected, then 2-hour rated walls and ceilings are not required.

Justification: The purpose of this amendment is to correlate with NFPA 20 requirements for a fire pump room, as amended.

913.2.1.1

913.2.1.1 Access. The fire pump room shall have an exterior access door.

Justification: The purpose of this amendment is to correlate with NFPA 20 requirements for a fire pump room, as amended.

913.2.2

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

Justification: The purpose of this amendment is to ensure that a drain is provided in the fire pump room, and to set a minimum drain size to handle spurious accumulation of water.

914.3.1

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 903.3.5.2.

Exception: An *automatic sprinkler system* shall not be required in ~~spaces or areas of:~~

~~1.~~ ~~O~~*open parking garages* in accordance with Section 406.5 of the International Building Code.

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

Justification: Correlation with IBC amendments, also correlates to amendment to 903.2 of the IFC, eliminating exception from sprinkler protection in areas of the high-rise building used for telecommunications equipment.

914.4.1

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

~~**Exceptions:**~~

~~1. That area of a building adjacent to or above the atrium need not be sprinklered, provided that portion of the building is separated from the atrium portion by not less than a 2-hour *fire barrier* constructed in accordance with Section 707 of the *International Building Code* or *horizontal assemblies* constructed in accordance with Section 711of the *International Building Code,* or both,~~
~~2. Where the ceiling of the atrium is more that 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.~~

Justification: Automatic sprinklers are required for protection of the structure as well as containment of fires at the floor level. Many jurisdictions in the valley do not allow omission of sprinklers without an engineering analysis of an alternative method of compliance replacing the automatic sprinklers. The exception allowing the omission of sprinklers at the ceiling levels of atriums predates research in new sprinkler technologies for high ceiling spaces.

914.6.1

914.6.1 Automatic sprinkler system. Stages shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.

Exceptions:

~~1.~~ ~~Sprinklers are not required under stages less than 4 feet (1219 mm) in clear height utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by not less than 5/8 inch (15.9 mm) Type X gypsum board.~~

1.~~2.~~ In buildings where an *automatic sprinkler system* is not otherwise required by other sections of this code, s~~S~~prinklers are not required for *stage*s 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.~~3.~~ Sprinklers are not required within portable orchestra enclosures on *stages*.

Justification**: Correlation with IBC amendments**. Exception 1 would result in partially sprinklered buildings, which is not consistent with the high level of protection that Southern Nevada has traditionally prescribed for buildings or portions of buildings containing stages, which typically have large corresponding occupant loads. Further, NFPA 13, as currently adopted and enforced in Southern Nevada, does not permit the omission of sprinklers identified in Exception 1

Exception 2 is modified so that partially sprinklered buildings also are not permitted for buildings containing small stages. If the building does not otherwise require sprinklers, however, the presence of a small stage as defined in this exception will not trigger the installation of fire sprinklers in the building.

This amendment is required for code correlation (NFPA 13 and the anticipated Southern Nevada amendments to the 2012 IFC) and to provide for consistency in regional interpretation and application of the codes.

914.8.2

914.8.2 Fire suppression. Aircraft hangars shall be provided with a fire suppression system designed in accordance with NFPA 409, based upon the classification for the hangar given in Table 914.8.2.

~~**Exception:** Where a *fixed base operator* has separate repair facilities on site, Group II hangars operated by a *fixed base operator* used for storage of *transient aircraft* only shall have a fire suppression system, but the system is exempt from foam requirements.~~

JUSTIFICATION: Correlation to IBC amendments (section 412.4.6)
The purpose of this amendment is to require hangars to be protected in accordance with NFPA 409. The exception would require policing of the hangar, which is not practical for the jurisdictions in Southern Nevada. The exception

to IFC Section 914.8.2 does not comply with the adopted NFPA 409 code. This amendment satisfies the SNBO Criteria for Code Amendment because it is required code correlation (IBC to IFC & NFPA 409) and it provides for consistency in regional interpretation and application of the codes.

915

SECTION 915

SMOKE REMOVAL

915.1 General. Where required by this code or otherwise installed, smoke removal systems shall conform to the requirements of this section and the Building Code.

915.2 Where Required.

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

915.2.2 Enclosed parking garage. A smoke removal system is required throughout enclosed parking garages. Fans capable of providing a minimum of 10 air changes per hour shall be provided. Fans shall be bidirectional, having capacity equal or greater in the reverse direction as the forward direction. Fans shall automatically exhaust upon sprinkler waterflow. Individual manual control shall be provided for each fan on a graphic smoke control panel adjacent to the fire alarm control panel. The system shall comply with the *fire code official's* guidelines.

915.3 Status Indicators and Controls. Status indicators and controls shall be designed in accordance with the *fire code official's* guidelines.

915.4 System Acceptance. Buildings, or portions thereof required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the *fire code official* determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation of the system.

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

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

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

Justification: This amendment provides direction for the new smoke removal systems required in the International Building Code.

916

SECTION 916

FIRE RISER ROOMS

916.1 Where required. A dedicated fire 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, a fire 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 NFPA 13D do not require fire riser rooms.
5. Systems designed in accordance with NFPA 13R shall have a riser room/closet that is large enough to facilitate access to all the necessary fire sprinkler and fire alarm valves and devices. This area shall be accessible from the outside with either a door or an access panel large enough to allow for testing and maintenance of system. The area shall also maintain a minimum temperature of 40° F and a maximum temperature of 100° F.

916.2 Contents. The primary fire riser room shall contain the fire riser into the building. The fire riser shall contain at a minimum, a flow switch, a check valve, and a control valve.

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

916.3 Exterior Access Door. Fire riser rooms shall have an exterior access door with a minimum width of 36 inches (914 mm) and a minimum height of 80 inches (2032 mm)

Exception: For high-rise, terminal, and covered mall buildings, secondary fire risers may be contained in fire riser rooms that are located in dedicated rooms with direct corridor access inside the building without direct access from the exterior.

916.4 Protection. Fire riser rooms shall be separated from the rest of the building by 1-hour fire partitions.

916.5 Conditioning. Fire riser rooms shall be conditioned to maintain a minimum temperature of 40° F and a maximum temperature of 100° F. Heating and cooling units shall be permanently wired. Portable heating and cooling units are not approved for meeting the requirements of this section.

Exceptions:

1. Where the riser room does not contain a Fire Alarm Control Unit or spare sprinklers heads, the riser 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 mechanical engineer, on a case-by case address specific basis, proving that the temperature within the riser room does not fall or rise below the temperature range of 40° F to 100° F. To maintain 40° F, the temperature analysis must use a starting temperature of 50° F and use an outside temperature of 0° F for a period of 8 hours. To maintain 100° F, the temperature analysis must use a starting temperature of 90° F and use an outside temperature of 120° F for a period of 8 hours.

916.6 Lighting. Permanently installed artificial lighting with back-up power shall be provided for the riser room.

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

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

916.9 Auxiliary control valves. Fire riser rooms are not required for auxiliary control valves.

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

Justification: The intent of this section is to provide minimum requirements for fire sprinkler riser room construction.

1006.3

1006.3 Emergency power for illumination. The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. *Aisles* and unenclosed egress *stairways* in rooms and spaces that require two or more *means of egress*.
2. *Corridors*, *exit enclosures* and *exit passageways* in buildings required to have two or more *exits*.
3. Exterior egress components at other than their *levels of exit discharge* until *exit discharge* is accomplished for buildings required to have two or more *exits*.
4. Interior *exit discharge* elements, as permitted in Section 1027.1, in buildings required to have two or more *exits*.
5. Exterior landings as required by Section 1008.1.6 for *exit discharge* doorways in buildings required to have two or more *exits*.
6. Electrical equipment rooms, *fire command centers*, fire pump rooms and generator rooms.
7. ~~Public restrooms with an area greater than 300 square feet (27.87 m2).~~ Public restrooms that are greater than 64 square feet (5.9 square meters) and accessed by *means of egress* components that are required to have emergency illumination.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604

Justification: IBC Correlation

1008.1.5

1008.1.5 Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope).

Exceptions:

1. *Unchanged.*
2. *Unchanged.*
3. *Unchanged*.
4. *Unchanged.*
5. *Unchanged.*
6. A single step with a maximum height of 7 inches (178 mm) is permitted for doors serving building equipment rooms that are not normally occupied and are not required to be accessible by Chapter 11.

Justification: IBC Correlation

1008.1.8

1008.1.8 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.

Justification: IBC Correlation.

1008.1.9.11

1008.1.9.11 Stairway doors. Interior *stairway means of egress* doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. Unchanged

2. Unchanged

3. In *stairways* serving buildings other than *high-rise buildings* ~~not more than four stories~~, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side. Except for exit discharge doors, the *stairway* doors shall be automatically ~~and capable of being~~ unlocked simultaneously without unlatching upon any of the following: a signal from the *fire command center*, if present, or a signal by emergency personnel from ~~a single~~ an approved location inside ~~the main entrance to~~ the building; activation of a *fire alarm system* or a fire sprinkler system in an area served by the stairway; or failure of the power supply.

4. Unchanged

5. Unchanged

6. Upon approval of the *building official*, *stairway* doors opening directly into *sleeping units*, *dwelling units* or tenant spaces are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side. The doors are permitted to unlock without unlatching only upon signal from the *fire command center*, if present, or a signal by emergency personnel from an approved location inside the building.

Justification: IBC Correlation.

1011.2

1011.2 Floor-level exit signs in Group R-1. Where exit signs are required in Group R-1 occupancies by Section 1011.1, additional low-level exit signs shall be provided in all areas serving guestrooms in Group R-1 occupancies and shall comply with Section 1011.5.

The bottom of the sign shall be not less than 10 inches (254 mm) nor more than 18 inches (455mm) ~~12 inches (305 mm)~~ above the floor level. The sign shall be flush mounted to the door or wall. Where mounted on the wall, the edge of the sign shall be within 4 inches (102 mm) of the door frame on the latch side.

Justification: IBC Correlation.

Table 1014.3

TABLE 1014.3

COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)
	Occupancy Load		
	≤ 30	>30	
B, S [d]	100	75	100 [a]
U	100	75	75 [a]
F	75	75	100 [a]

H-1, H-2, H-3	Not Permitted	Not Permitted	25 [a]
R-1	75	75	125 [b]
R-2	75	75	125 [b]
R-3 [e]	75	75	125 [b]
I-3	100	100	100 [a]
All others [c,f]	75	75	75 [a]

Justification: IBC Correlation

1015.1

1015.1 Exits or exit access doorways from spaces. Two *exits* or *exit access* doorways from any space shall be provided where one of the following conditions exits:

1. The *occupant load* of the space exceeds one of the values in Table 1015.1.

   Exceptions:

   1. In Group R-1, R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual *sleeping units* or *dwelling units* with a maximum occupant load of 20 where the *sleeping unit* or *dwelling unit* is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

   2. Care suites in Group I-2 occupancies complying with Section 407.4.3.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.

3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

Justification: IBC Correlation

1015.2.2

1015.2.2 Three or more exits or exit access doorways. Where access to three or more exits is required, at least two exit doors or exit access doorways shall be arranged in accordance with the provisions of Section 1015.2.1. Additional *exits* or *exit access doorways* shall be distributed so that if one becomes blocked, the others will be available.

Justification: IBC Correlation.

1022.4

1022.4 Openings and penetrations. *Interior exit stairway* and *ramp* opening protectives shall be in accordance with the requirements of Section 716 of the International Building Code.

Openings in *interior exit stairways* and *ramps* other than unprotected exterior openings shall be limited to those necessary for *exit access* to the enclosure from normally occupied spaces and for egress from the enclosure.

Elevators shall not open into *interior exit stairways* and *ramps*.

Exceptions:

1. In buildings required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* serving a *story* with a floor surface located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge, and accessed by way of a vestibule in accordance with Section 909.20.4 of the International Building Code for the stairway and vestibule pressurization alternative are permitted to provide a second vestibule providing access into the required vestibule for areas considered normally non-occupied spaces. The second vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection connected to the building fire alarm system shall be provided within the second vestibule.
2. In buildings required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* serving a *story* with a floor surface located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge, and designed in accordance with Section 909.20.5 of the International Building Code (stair pressurization alternative) are permitted to provide a vestibule providing access into the interior exit stairway for areas considered normally non-occupied spaces. The vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection connected to the building fire alarm system shall be provided within the vestibule.

3. In buildings not required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* are permitted to provide a vestibule between the floor and the *interior exit stairway* for areas considered normally non-occupied spaces. The vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection shall be provided within the vestibule. Where a building fire alarm system is provided, the vestibule smoke detector(s) shall be connected to the building fire alarm system.

Justification: IBC Correlation

1028.6.2.3

1028.6.2.3 Automatic sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing *smoke-protected assembly seating* shall be protected with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

Exceptions~~:~~

1. ~~The floor area used for contents, performances or entertainment provided the roof construction is more then 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.~~
2. ~~Press boxes and storage facilities less than 1,000 square feet (93 m2) in area,~~
3. ~~3.~~ Outdoor seating facilities where seating and the *means of egress* in the seating area are essentially open to the outside.

Justification: **Correlation to IBC amendments**
Exception Nos. 1 and 2 to Section 1028.6.2.3 are not necessary and would result in partially sprinklered buildings, which is not consistent with the high level of protection that Southern Nevada has traditionally prescribed for buildings or portions of buildings containing large assembly uses.

There is substantial evidence that automatic sprinkler systems, in the correct configuration, are effective at heights exceeding 55 feet (related to atriums), let alone 50 feet. There is no technical justification for the omission of sprinklers allowed by Exception No. 1.

NFPA 13 (2010), Section 8.1.1(1) requires sprinklers throughout the premises. Under certain conditions, NFPA 13 permits the omission of sprinklers in certain areas and spaces within a building (see Section 8.15 “Special Situations”). However, NFPA 13 does not permit the omission of sprinklers above a floor area used for contests, performances or entertainment just because the roof construction is more than 55 feet above the floor, nor does NFPA 13 permit the omission of sprinklers in press boxes and storage facilities less than 1,000 square feet in area. If the building is required to be sprinklered throughout, and NFPA 13 does not permit the omission of sprinkler in the locations listed in Exception Nos. 1 and 2, then Exception Nos. 1 and 2 should be deleted for code/standard consistency.

For special circumstances where sprinkler ineffectiveness can be sufficiently demonstrated, the designers can still propose the omission of sprinklers at the ceiling of a tall (> 50 feet) assembly seating space under the Alternate Method process. However, by deleting Exception No. 1, the designers will be required to address each project on a case-by-case basis, which is not unreasonable. Entirely removing automatic sprinkler protection from any room should be carefully considered prior to having a blanket allowance such as is provided in Exception Nos. 1 and 2.

Exception No. 3, which permits the omission of sprinklers in outdoor seating facilities where the seating and the means of egress in the seating area are essentially open to the outside, is proposed to remain but be renumbered accordingly.

The proposed amendment satisfies the SNBO Criteria for Code Amendments because it is required for code correlation (NFPA 13).

1101.1

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to adoption of this code.

> **Exception:** Retroactive provisions contained within this code that are more stringent than retroactive provisions adopted by the State Fire Marshal shall not be enforceable until approval for such enforcement is obtained from the State Board of Examiners in accordance with NRS 477.110.

Justification: This exception essentially requires that the fire code official only enforce retroactive provisions that are supported by state code adoption, as more stringent enforcement of retroactive provisions by a local government is prohibited by state law.

1101.4.2

1101.4.2 Completion of work. Work necessary to comply with this chapter shall be completed within a time schedule approved by the fire code official. Where a retrofit installation is required by this code, timelines for installation and completion shall be negotiated between the building owner and the fire code official

Justification: This amendment requires the building owner and the fire code official to enter into a phasing agreement for compliance with retroactive requirements.

1101.5

1101.5 New work in existing buildings. Where new work occurs in an existing building or facility, such work shall be in accordance with current code, and fire protection systems impacted in the work area shall be upgraded to current code requirements commensurate with the overall scope of new work.

> **Exception:** Replacement of finishes, furnishings, plumbing fixtures, electrical fixtures, and equipment, which does not increase the fire hazard, shall not require upgrade of fire protection systems.

Justification: This section provides guidance as to what kinds of new work require fire protection system components to comply with current code requirements.

1103.2

1103.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage, as determined by the Fire Chief, ~~based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building~~, in accordance with Section 510.4.1 shall be equipped with such coverage ~~according to the following~~ in accordance with Section 510 within a time frame established by the *fire code official.*

1. ~~Wherever 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.~~

Building owners shall submit to the *fire code official* a radio signal strength study, technical opinion and report prepared in accordance with Section 104.7.2. The report shall identify the area(s) requiring an emergency responder radio coverage system to comply with Section 510.4.1.

Exceptions:

3. Where *approved* by the *fire code official*, an existing *approved* wired communication system in accordance with Section 907.2.13.2 shall be permitted to be maintained in lieu of an approved radio coverage system.

4. Where it is determined by the *fire code official* that the radio coverage system is not needed.

Justification: These changes are made to the specific requirements for radio systems in order to ensure that the requirements for radio systems are compatible with emergency responder equipment, existing laws and ordinances.

2007.1

2007.1 General. All helistops and heliports shall be designed and constructed in accordance with this code, NFPA 418, and FAA AC No:150/5390-2C. Helistops and heliports shall be maintained in accordance with Sections 2007.2 through 2007.8. Helistops and heliports on buildings shall be constructed in accordance with the *International Building Code*.

Justification: The purpose of this amendment is to require that NFPA 418 has jurisdiction over all heliports and helistops. Previous code excerpted substantial material from NFPA 418. By adopting the entire NFPA 418, applicable portions of the code will be applied in this jurisdiction. The reference to FAA regulations tells the code users that the FAA has design and installation criteria that need to be adhered to.

2404.2

2404.2 Location of spray-finishing operations. Spray finishing operations conducted in buildings~~s~~ 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 any other areas in accordance with the International Building Code. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth, or 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 2404.9.
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.

Justification: This code modification is intended to address the issue of spraying operations in buildings with mixed occupancies. It is clear that spray operations in sensitive occupancies require a higher level of protection. However, it is not clear that this level of protection is required when the spray operation occurs in other occupancies, which happen to be in a building that contains the sensitive occupancy. In many major facilities, spraying operations are undertaken in back-of-house areas that do not contain Use Groups A, E, I or R occupancies. The intent of this code change is to allow those spraying operations to occur in spray booths, even if the building contains other use groups, including the sensitive Groups A, E, I and R.

3201.3

3201.3 Construction documents. At the time of building permit application for new structures designed to accommodate high-piled storage or for requesting a change of occupancy/use, and at the time of application for a storage permit, plans and specifications shall be submitted for review and approval. In addition to the information required by the International Building Code, the storage permit submittal shall include the information specified in this section. Following approval of the plans, a copy of the approved plans shall be maintained on the premises in an approved location. The plans shall include the following:

1. 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 suppression and fire detection systems.

a. For density/area fire sprinklers protecting the high-piled storage area, indicate the sprinkler identification number (SIN), the sprinkler k factor, square footage of the remote area, and the system design density. If the SIN is not available, a copy of the manufacturer specification sheet for the sprinkler head is required.
b. For specific application sprinklers, such as large-drop and ESFR sprinklers, protecting the high-piled storage area, indicate the sprinkler identification number (SIN), the sprinkler k factor, the number of sprinkler heads in the remote area, and the minimum residual pressure provided at the most hydraulically demanding sprinkler head. If the SIN is not available, a copy of the manufacturer specification sheet for the sprinkler head is required.

11. 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, when 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*.

Justification: The purpose of this amendment is to clarify the information needed for analysis of the fire sprinkler system. In order to determine the adequacy of the sprinkler system, it is necessary to determine the sprinkler head listing allowances, orifice size, and system design criteria. These can be used to review the requirements of NFPA 13 to determine if the sprinkler system is adequate for the proposed storage. Additionally, the amendments require identification of shelving material used, and for availability of fire flow.

3208.2.2

3208.2.2 Racks with solid shelving. Racks with solid shelving having an area greater than 20 square feet (1.86 m^2) ~~32 square feet (3 m^2)~~, measured between approved flue spaces at all four edges of the shelf, shall be in accordance with this section.

Exceptions:

1. Racks with mesh, grated, slatted, or similar shelves having uniform openings not more than 6 inches (152 mm) apart, comprised of at least 50 percent of the overall shelf area, and with approved flue spaces are allowed to be treated as racks without solid shelves.
2. Racks used for the storage of combustible paper records, with solid shelving, shall be in accordance with NFPA 13.

Justification: The purpose of this amendment is to correlate the IFC with NFPA 13. NFPA 13, section 16.1.6.1, requires that when solid shelves are between 20 and 64 square feet that each row of shelving needs to have in-rack sprinklers. The IFC does not send the user to NFPA 13 for sprinkler protection until the shelf area exceeds 32 square feet. By changing the IFC trigger point to 20 square feet, the two codes are correlated.

3310.3

3310.3 Site identification sign. The street address of the construction site shall be posted on the street side of the site. Signage shall have approved address numbers, buildings numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Signage shall have nominal 12" high, 1" stroke numbering and lettering.

Justification: This amendment is intended to assist fire crews in reaching the correct location in an expeditious manner.

3312

SECTION 3312

WATER SUPPLY FOR FIRE PROTECTION

3312.1 When required. An approved water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible material arrives on the site. Additional fire flow shall be provided upon commencement of vertical construction in accordance with Section 3312.

3312.2 Volume required. 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 shall be required.

> **Exception:** Where approved by the fire code official for rural areas or other areas with decreased fire flow capacity, the minimum required fire flow may be reduced below 1,500 gpm

3312.3 Combustible material protection. Where combustibles are delivered to a construction site, a minimum fire flow in accordance with Section 3312.2 shall be provided. The fire hydrant(s) shall be within 300 feet of combustible materials.

3312.4 Vertical construction, combustible construction Types III, IV, and V. Required fire flow shall be provided at the commencement of vertical construction in accordance with the separation distance as specified in this section.

3312.4.1 Separation up to 20 feet (6.1m). Where the structure is separated 20 feet (6.1m) or less from property lines against property that has an existing structure or otherwise can be constructed upon, a fire flow of no less than 100% of the required fire flow, including all required hydrant locations, shall be provided.

3312.4.2 Separation greater than 20 feet (6.1m) up to 60 feet (18.3m). Where the structure is separated greater than 20 feet (6.1m) and up to 60 feet (18.3m) from property lines against property that has an existing structure or otherwise can be constructed upon, a fire flow of no less than 50% of the required fire flow shall be provided. Sufficient hydrants to accommodate the required flow shall be provided, subject to approval by the *fire code official*.

3312.4.3 Separation greater than 60 feet (18.3m). Where the structure is separated greater than 60 feet (18.3m) from property lines against property that has an existing structure or otherwise can be constructed upon, fire flow shall be provided in accordance with Section 3312.2. The fire hydrant(s) shall be within 300 feet of the structure protected.

3312.5 Vertical construction, non-combustible construction Types I and II. Fire flow is not required prior to commencing vertical construction of non-combustible construction buildings. Where combustible materials are delivered to the construction site, fire flow in accordance with Section 3312.3 shall be provided. When a standpipe per Section 3313 is provided, fire flow shall be provided in accordance with Section 3312.2.

3312.6 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.

3312.7 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*.

3312.8 Access. Access in accordance with Section 3310 shall be provided between all hydrants required by this section and the construction being protected.

Justification: The purpose of this amendment is to specify the protection from hydrants that are required during construction. The old UFC required full fire flow to be provided as soon as construction commenced. Some jurisdictions found that requirement to be excessive, and provided relief from that requirement, especially for non-combustible construction. The new IFC does not require any fire flow for buildings other than construction, other than what is required for delivery of combustible materials. This proposal is made because the IFC requirements are seen as being too lenient. This proposal intends to provide for a compromise between the old UFC requirements and the new IFC requirements.

The proposal requires some fire flow protection for combustible materials and construction. For vertical construction with combustible materials, this proposal provides relief for buildings that have significant distance from other buildings, or properties where buildings may be constructed. There have been several fires locally, most notably the Firenze Apartment fire in 2003, which have shown that unprotected combustible structure fires can cause damage across normal property lines. Therefore, the full fire flow is required when a combustible construction building is within 20 feet of a property line against property on which construction is possible. There are reductions permitted in the required fire flow when the separation distance exceeds 20 feet.

The proposal allows non-combustible construction to occur with no requirement for fire flow. The code would still require fire flow for any combustible materials on the site, even if the construction is non-combustible. This is allowable since there appears to be no minimum provided for in the IFC, and since there is little hazard in non-combustible buildings until such buildings are loaded with combustible products.

When combustible loading is permitted, this proposal requires the full fire flow. This is necessary because upon loading of combustibles, the building has approached the anticipated fire hazard. As such, this proposal addresses the fire hazard by requiring the full fire flow.

Finally, a section that speaks to access between the hydrants and the combustibles or building protected is provided.

5001.4

5001.4 Retail and wholesale storage and display. For retail and wholesale storage and display of nonflammable solid and nonflammable or noncombustible liquid hazardous material in Group M occupancies and storage in Group S occupancies, see Sections 5002 and 5003.11.

Justification: This proposed code change is intended to be a pointer to the newly added definition of retail and wholesale.

5001.5.1

5001.5.1 Hazardous Materials Management Plan. Where required by the *fire code official* or when the Maximum Allowable Quantity per control area is exceeded, an application for a permit shall include a Hazardous Material Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:

1. Access to each storage and use area.
2. Location of emergency equipment.
3. Location of where liaison will meet emergency responders.
4. Facility evacuation meeting point locations.
5. The general purpose of other areas within the building.
6. Location of all above-ground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.
7. The hazard classes in each area.
8. Locations of all control areas and Group H occupancies.
9. Emergency exits.

Justification: The amendment adds the explanation that HMMPs will only be required when the MAQ is exceeded.

5001.5.2

5001.5.2 Hazardous Materials Inventory Statement (HMIS). Where required by the *fire code official*, an application for a permit shall include an HMIS, such as Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report or other *approved* statement. The HMIS shall include the following information:

1. Product Name.
2. Component.
3. Chemical Abstract Service (CAS) number.
4. Location where stored or used.
5. Container size.
6. Hazard Classification.
7. Amount in Storage.
8. Amount in use-*closed systems*.
9. Amount in use-*open systems*.
10. Aggregate quantities per control area.
11. Site plan/Floor plan with designated control areas and details of 704 placard for facility and for each control area.
12. Sprinkler design criteria, if sprinklered.
13. Cabinets or exhausted enclosures.
14. NFPA 704 hazard numbers.

Justification: This proposed code change adds five items to the HMIS lists which facilitate the analysis and review of Hazardous Materials permit application plans.

5002

RETAIL AND WHOLESALE. The sale of new or used goods to: consumers; retailers; industrial, commercial, institutional or professional users; or to other wholesalers.

Justification: This proposed code change is intended to add a new definition into Section 5002 the newly added definition of retail and wholesale.

5003.2.2.1

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. Readily accessible manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:
   3.1 The point of use.
   3.2 The tank, cylinder or bulk source
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall be clearly visible, accessible and indicated by means of a sign.
5. Backflow prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.
6. Where gases or liquids having a hazard ranking of:

   Health Class 3 or 4
   Flammability Class 4
   Instability Class 3 or 4

   In accordance with the NFPA 704 are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103kPa), an *approved* means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

   Exceptions:

   1. Piping for inlet connections designed to prevent backflow.
   2. Piping for pressure relief devices.

7. New and existing remote tank filling connections shall be in accordance with this subsection 7.
   7.1 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*.
   7.2 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, sized appropriately.

7.3 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, sized appropriately.

Justification:
The amendment adds language to prevent the accidental transfer of incompatible liquids through remote filling stations. Often at locations that have water features, the acid and base fill ports are adjacent to each other. Recent history has demonstrated that liquids can be transferred into the wrong tank resulting in significant building occupant exposure to reaction products.

5003.5

5003.5 Hazard Identification signs. Unless otherwise exempted by the *fire code official*, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary containers and above-ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the *fire code official*.

5003.5.1 Signage Rating Method. Where more than one chemical is present in a building or specific area, signs shall be provided using one of the following methods:

(1) *Composite Method.* Where many chemicals are present, a single sign shall summarize the maximum ratings contributed by the material(s) in each category and the special hazard category for the building and/or the area.
(2) *Individual Method.* Where only a few chemicals are present or where only a few chemicals are of concern to emergency responders (taking into account factors including physical form, hazard rating, and quantity), individual signs shall be displayed. The chemical name shall be displayed below each sign.
(3) *Composite-Individual Combined Method.* A single sign shall be used to summarize the ratings via the Composite method for buildings or other numerous chemicals. Signs based on the individual Method shall be used for rooms or smaller area within the building containing small numbers of chemicals.

~~2703.5.1~~ **5003.5.2 Markings.** Individual containers, cartons, or packages shall be conspicuously marked or labeled in an approved manner. Rooms or cabinets containing compressed gases shall be conspicuously labeled: COMPRESSED GAS.

Justification: The amendment adds the language from NFPA 704.4.2.3.3, which describes the NFPA hazard rating methods, as section 5003.5.1. The original section 5003.5.1 is re-numbered 5003.5.2.

5003.8.3.5

5003.8.3.5 Hazardous materials in *retail and wholesale* Group M display and storage areas and in retail and wholesale Group S storage areas. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single *control area* of a *retail and wholesale* Group M display and storage area or a retail and wholesale Group S storage area is allowed to exceed the *maximum allowable quantities per control* area specified in Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with Section 5003.11.

Justification: This proposed code change is intended to clearly specify that Table 5003.11.1 maximum allowable quantities refer to retail and wholesale purposes in both M and S occupancies. This change also correlates to IFC Section 5003.1.1, which uses the "Retail and Wholesale" designation in stipulating the occupancies permitted to use Table 5003.11.

5003.8.8

5003.8.8 Hazardous Materials Information Storage. When required by the *fire code official* new or existing buildings or facilities containing hazardous materials in quantities exceeding the maximum allowable quantity per control area, a KNOX Cabinet Series 1300, 7 inch depth with dual locks and rain hood part number 1201 shall be installed in an *approved* location.

Justification: This is a current local amendment to the International Fire Code. This amendment facilitates emergency response by requiring information storage for a building or facility housing hazardous materials. The building or facility hazardous material inventory statement and hazardous material management plan will be stored in a location approved by the *fire code official*. It is then available to fire rescue operations personnel in an emergency.

5003.11

5003.11 Retail and wholesale Group M storage and display and retail and wholesale Group S storage. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single *control area* of a retail and wholesale Group M display and storage occupancy, or an outdoor *control area*, or stored in a single *control area* of a retail and wholesale Group S storage occupancy, is allowed to exceed the *maximum allowable quantities per control* area indicated in Section 5003.1 when in accordance with Sections 5003.11.1 through 5003.11.3.10.

Justification: This proposed code change is intended to clearly specify that Table 5003.11.1 applies to maximum allowable quantities for retail and wholesale purposes in M and S occupancies.

5003.11.1.1

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

Exception: Single-story buildings.

Justification: Table 5003.11.1 specifies maximum allowable quantities for M and S occupancies. These quantities are approximately 10 times the maximum allowable quantities listed in Table 5003.1.1(1) through 5003.1.1(4) which are applicable for occupancies other than M and S yet the protection offered by an M or S occupancy is less than that afforded by an H. Theoretically, a portion of a mixed-use building could be designated as an S occupancy and Table 5003.11.1 used to justify the storage of quantities of hazardous materials that under Table 5003.1.1 (1) through 5003.1.1(4) would require an H occupancy. Making Table 5003.11.1 not applicable to A, E, I and R occupancies ensures that occupants will not be sleeping, detained, or be in a day care in the same building with quantities of hazardous materials that normally could only be stored in an H occupancy room.

5301.1

5301.1 Scope. Storage, use and handling of compressed gases in compressed gas containers, cylinders, tanks and systems shall comply with this chapter, including those gases regulated elsewhere in this code. Partially full compressed gas containers, cylinders or tanks containing residual gases shall be considered as full for the purposes of the controls required.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Compressed natural gas (CNG) for use as a vehicular fuel shall comply with Chapter 23, NFPA 52 and the *International Fuel Gas Code*.

Cutting and welding gases shall also comply with Chapter 35.

Cryogenic fluids and liquid CO^2 shall comply with Chapter 55. Liquefied natural gas for use as a vehicular fuel shall also comply with NFPA 52 and NFPA 59A.

Compressed gases classified as hazardous materials shall also comply with Chapter 50 for general requirements and chapters addressing specific hazards, including Chapters 58 (Flammable Gases), 60 (Highly Toxic and Toxic Materials), 63 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 64 (Pyrophoric Materials).

LP-gas shall also comply with Chapter 61 and the International Fuel Gas Code.

Justification: The change is to require that liquid CO2 be treated in accordance with Chapter 55, which deals with cryogenic liquids. While not technically a cryogen, CO2 is very similar to a cryogen, and thus should be protected the same as cryogenic liquids.

5306.5

5306.5 Medical gas system plan submittal. Plans and specifications shall be submitted for review and approval. Following approval of the plans, a copy of the approved plans and permit shall be maintained on the premises in an approved location. As required by the *fire code official*, the plans shall include the following:

1. Project name, street address and owners name.
2. Contractor name, address, phone number, license numbers (City, State Contractor and State Fire Marshal).
3. Signature of the licensee (contractors Master or Qualified Employee) or seal and signature of a Professional Engineer licensed in the state of Nevada.
4. Code edition of standards used in the design.
5. System classification (Level).
6. When used - gas type, container size and quantity.
7. Symbol legend with equipment description (manufacture's name and model number) and mounting description (surface, semi-flush, flush, and exterior).
8. Site plan.
9. Floor plan drawn to an indicated scale (1/8" minimum) on sheets of a uniform size showing:
   a. Point of compass (north arrow).
   b. Walls, doors, windows, openings, stairs, elevators, passageways, high-piled storage racks, etc., as applicable to depict the facility.
   c. Room use identification labels.
   d. Gas, air and vacuum piping distribution systems, manifolds, sizes and material types. Piping hangers and slopes.
   e. Valves and valve boxes, outlets, gages and other components.
   f. Electrical warning systems (local and master alarm panels), conductor/conduit routing and size, power panel and circuit connection.
   g. Key plan.
   h. Compressor inlet location and vacuum exhaust outlet location.
   i. For interior gas supply rooms provide construction fire ratings, ventilation and fire sprinkler information.
10. Product data submittal including a cover index sheet listing products used by make and model number, manufacturer data sheets (highlighted or marked) and listing information for all equipment, devices, and materials.
11. Design number and detail of penetration fire stop system when required.
12. Verification & inspection requirements.
13. Name of independent medical gas testing agency to certify the system.
14. Any additional information determined necessary.

Justification: This is amendment provides guidance on required items for application of a compressed gas permit associated with medical gas systems.

5306.6

5306.6 Medical gas systems, testing. Hyperbaric systems and medical gas systems required by NFPA 99 to be verified by person other than the installing contractor shall be certified by an independent medical gas testing agency prior to use of the system. The independent medical gas inspector shall hold a current NITC certification and Nevada State Fire Marshal certification as a medical gas inspector. The *fire code official* may witness any or all testing. Copies of the system certification shall be provided to the *fire code official*.

Justification: This is amendment provides guidance for the testing of medical gas systems.

5307.3

5307.3 Liquefied carbon dioxide.

1. Construction and operational permits shall be obtained for liquefied carbon dioxide containers or systems.

2. Rooms containing liquefied carbon dioxide tanks, cylinders or containers must be equipped with approved sensors capable of detecting carbon dioxide concentrations of 3% v/v (30,000 parts per million(OSHA STEL).

3. Approved sensors shall be connected to local visible and audible alarms which will alert building occupants at the space containing the liquefied carbon dioxide tank, cylinder, or container when the carbon dioxide level within the room reaches 3% v/v.

4. Rooms required to be equipped with carbon dioxide sensors/alarms, must display signage at the entrance to the room that warns occupants not to enter when alarms are activated.

Justification: Recent events that have led to fatalities and injuries have been caused by release of CO2 has caused code bodies and various industries to implement protective measures for workers.

5601.1.3

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

Exceptions:

1. Storage and handling of fire works 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 such fireworks comply with CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR, Parts 100-185, 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".

Justification: This amendment is intended to provide consistency for regional application of codes. This amendment allows for the sale of consumer fireworks throughout valley. The Fire Prevention Association of Nevada has along standing guideline as well as a dedicated team of professionals that test these products and work with vendors every year.

5601.2.2

5601.2.2 Sale and retail display. ~~No person shall construct a retail display nor offer for sale explosives, explosive materials, of fireworks upon highways, sidewalks, public property, or in Group A or E occupancies~~. All sales and retail displays of fireworks and explosives are prohibited.

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

Justification: This amendment is intended to provide consistency for regional application of codes.

5601.2.4

5601.2.4 Financial Responsibility. Before a permit is issued, as required by Section 5601.2, the applicant shall file with the jurisdiction a ~~corporate surety bond in the principal sum of $100,000 or a public liability insurance policy for the same amount~~ valid certificate of insurance complying with Section 105.1.4.1 in the amount of $5,000,000.00, for the purpose of the payment of all damages to persons or property which 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 ~~or lesser~~ amount when, in his or her opinion, conditions at the location of use indicate a greater ~~or lesser~~ amount is required. ~~Government entities shall be exempt from this bond requirement.~~

Justification: Continuation of an existing amendment. This amendment provides for a minimum 5M certificate of insurance for blasting activities.

5601.2.4.1

5601.2.4.1 Blasting. Before approval to do blasting is issued, the applicant for approval shall ~~file a bond or~~ 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.

Justification: This amendment is to correlate the certificate of insurance requirement with Chapter 1.

5601.2.4.2

5601.2.4.2 Fireworks Display. The permit holder shall furnish a ~~bond or~~ certificate of insurance as specified in Chapter 1 ~~in an amount deemed adequate by the *fire code official*~~ for the payment of all potential damages to a person or persons or to property by reason of the permitted display, and arising from any acts of the permit holder, the agent, employees or subcontractors.

Justification: This amendment is intended to provide consistency for regional application of codes. This amendment is to correlate the certificate of insurance requirement with Chapter 1.

5601.5

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.

Justification: The *fire code official* or designee will verify substantial compliance with the codes, standards and guidelines prior to initiation of the pyrotechnic effect.

5603.8

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.

Justification: This information is crucial in the event that there are any discrepancies, complaints, or incidents. Having the report available to the *fire code official* will greatly simplify any investigations or inquires. It also provides a degree of protection to the blasting or pyrotechnics operator by having the documentation. These reports are already required by many insurance companies, and some federal regulations.

5604.1

5604.1 General. Storage of explosives and explosives 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*.

Justification: This amendment is intended to provide consistency for regional application of codes. This code amendment is made to ensure that applicants are aware that approval is required by the planning and/or zoning authority, in addition to approvals in accordance with the Fire Code.

5604.6.5

5604.6.5 Signs and placards. Property upon which Type 1 magazines and outdoor magazines of Types 2, 4 and 5 are located shall be posted with signs stating: NO SMOKING and EXPLOSIVES—KEEP OFF. These signs shall be of contrasting colors with a minimum letter height of 3 inches (76 mm) with a minimum brush stroke of ½ inch (12.7 mm). The signs shall be located to minimize the possibility of a bullet shot at the sign hitting the magazine.

Justification: This amendment adds the requirement for no smoking signs in order to reduce sources of ignition.

5604.6.5.2

5604.6.5.2 Placards. Type 5 magazines containing Division 1.5 blasting agents shall be prominently placarded during storage as required during transportation by DOTn 49CFR, Part 172 and DOTy 27 CFR, Part 55. All other magazines shall be labeled with the hazard classification only.

Justification: This amendment allows for correlation with other federal storage requirements and will provide a means for first responders to identify the type of products stored in the magazines. In the past emergency responders have been killed in the line of duty due to poor signage or lack of proper signage at explosives storage sites.

5604.7.1

5604.7.1 Security. Magazines shall be kept locked in the manner prescribed in NFPA 495 at all times except during placement or removal of explosives, inventory, or inspection. In addition to the locking requirements the following security measures shall be required at all 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 outdoor explosives magazines and storage sites shall be equipped with an approved centrally monitored security system.

Exception: For temporary installations with a duration of less than 30 days, 24 hour manned security guards may be used in lieu of the centrally monitored security system when approved by the *fire code official*.

Justification: These new requirements are necessary to fill a hole in the code, and address the need for security of all explosives storage sites. At this time the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) relies on local jurisdiction to implement security requirements. Several jurisdictions throughout the United States already require security systems or manned security guards for explosives storage sites.

5605.1

5605.1 General. The manufacture, assembly and testing of explosives, ammunition, blasting agents and fireworks is prohibited ~~shall comply with the requirements of this section and NFPA 495 or NFPA 1124.~~

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 blasting 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.

Justification: This amendment is intended to provide consistency for regional application of codes. This amendment is made to prohibit the manufacture of explosive materials for certain purposes. The manufacture of explosive materials is a hazard that is not acceptable for this jurisdiction.

5607.3

5607.3 Blasting ~~in congested areas.~~ When blasting is done ~~in a congested area or~~ 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 be 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. 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 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. The maximum airblast shall not exceed 120 db at the nearest structure.
5. Monitoring results shall be reported to the *fire code official* within 48 hours in a manner prescribed by the *fire code official*.
6. The blasting contractor shall provide a minimum of 72 hours prior written notice 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*.
7. For utility notification see 5607.5.
8. The blasting contractor shall notify the fire department and fire dispatch a minimum of two (2) hours prior to each blast, and immediately following each blast in a manner prescribed by the *fire code official*.
9. The blasting contractor shall provide for pre-blast, project duration, and post blast inspections of neighboring properties within 300 feet from the nearest blast hole, upon which are located structures in close proximity to the blasting area, or when otherwise required by condition of the *fire code official*. These inspections must be completed by a third party engineering firm.
10. 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 closures, and detour routes. This plan may be subject to the approval of the local law enforcement, of traffic enforcement agency.
11. The blasting contractor shall be responsible for removing and cleaning up any blast-related 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*.

Justification: This amendment was created using criteria from existing amendments. It has been relocated to a more appropriate section of the code. These amendments are necessary to continue to provide guidelines for blasting activities involving development blasting, quarry blasting, mining operations, and all other forms of explosives use and blasting that may occur throughout Southern Nevada.

5607.4

5607.4 Restricted hours. ~~Surface b~~Blasting operations shall be limited to the hours of 8 a.m. to 4 p.m., Monday through Friday, excluding state-recognized holidays.~~. only be conducted during daylight hours between sunrise and sunset. Other blasting shall be performed during daylight hours~~ unless otherwise approved by the *fire code official*.

Justification: This amendment is intended to provide consistency for regional application of codes. The limit on hours is to avoid complaints from residents regarding the timing of blasts. By keeping blasts to normal working hours, the expectation is that the blasts will not have as great an impact on residents.

5607.5

5607.5 Utility Notification. ~~Whenever blasting is being conducted in the vicinity of utility lines or rights-of-way, the blaster shall notify the appropriate representatives of the utilities at least 24 hours in advance of blasting, specifying the location and intended time of such blasting. Verbal notices shall be confirmed with written notice.~~ 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 when *approved*.

Justification: This amendment allows the code to comply with the NRS which requires the use of call before you dig. Currently many jurisdictions use a sign off sheet that may not reach the appropriate people at the utility company, and only requires a sign off from locally based companies. There are many companies providing services for power (WAPA), natural gas (Kern River), phone (AT&T), or fiber optic cables that may not be currently notified even though they have utilities in the area. Utilizing the call before you dig ticket number requires the blasting company to give an accurate description of the blast site, mark the area by the blasting contractor and the utility companies, a minimum of 48 hours notification to ALL utilities in the area (local and out of state), often times triggers field meets, and the "dig ticket" must be renewed every 14 days to maintain active status. In addition to these benefits the call before you dig ticket number must be used to schedule a utility company standby during blasting operations, for example if blasting within 300 ft. of Southwest Gas natural gas lines a representative from Southwest Gas must be present. You cannot schedule the gas company to come out without a call before you dig ticket number. The contractor can request a fax copy of the dig ticket that will include the ticket number and a list of all the utilities notified.

5607.6

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 snow storms, or other sources of extraneous energy.

Justification: Electronic detonators are an emerging new technology that pose the same dangers as electric detonators, but have not been addressed in the code. They are referenced in NFPA 495.

5607.13

5607.13 ~~Firing Control~~ Pre-blast procedures. No blast shall be fired until~~: the blaster had made certain that all surplus *explosive materials* are in a safe place in accordance with Section 5607.10, all persons and equipment are at a safe distance or under sufficient cover and that an adequate warning signal has been given.~~

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

Justification: This amendment adds safety feature to the pre-blast procedures and uses language that better flows within the code.

5607.13.1

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

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

Justification: This amendment adds a time frame to the warning signal in accordance with industry best practices. Currently there are no requirements for warnings signals. This is a potential safety hazard for those persons working on or near any blasting operations.

5607.14

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

1. No *person* shall 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 5607.13.1

Justification: This amendment adds an all clear warning signal to alert those working on or around the blast site that it is safe to re-enter the area. This amendment is necessary to correlate with other amendments and fill a gap left in the code.

5608.1

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

Justification: The purpose of this amendment is to ensure that firework and pyrotechnic displays comply with required rules and regulations in order to ensure as safe a display as possible. This amendment adds checklist items required by the local *fire code official*.

5704.2.9.2.5

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

Table 5704.2.9.2.5(a)

Hose Stream Demand for Tanks Storing Flammable and Combustible Liquids [1]

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

[1] Required flows may be reduced by half for horizontal tanks

[2] Add 250 gpm for each 100 ft. increase in tank diameter above 100 ft.

Table 5704.2.9.2.5(b)

Estimated Water Demand for Fixed Foam Protection for a full Surface Fire

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

Justification: The Fire Code does not provide sufficient guidance for required fire flow for storage of flammable and combustible materials, as the majority of guidance is specific to building construction. In the past, local fire departments have referred to FM guidelines to address required flow at flammable/combustible liquids storage facilities. The methodology and the tables above are directly quoted from FM Global Data Sheet 7-88, *Flammable Liquid Storage Tanks*. Including this information in the code will aid customers in knowing the design requirements. These flows are necessary to ensure sufficient water is brought to the site during the development phase to ensure sufficient water for fighting potential fires.

5704.2.13.1.3

5704.2.13.1.3 Out of service for one year. Underground tanks that have been out of service for a period of one year shall be removed from the ground in accordance with Section 5704.2.14 ~~or abandoned in place in accordance with Section 5704.2.13.1.4.~~ Coordination and compliance with Environmental Health Division of Southern Nevada Health District for tank removal is the responsibility of the owner and contractor.

Justification: The Southern Nevada Health District is the regulatory authority with respect to environmental oversight of underground storage tanks. Local *fire code official*s work in coordination with them when a tank is removed but the responsibility to coordinate and comply with their requirements is the contractor's.

5704.2.13.1.4

~~**5704.2.13.1.4 Tanks abandoned in place.** Tanks abandoned in place shall be as follows:~~

~~1. Flammable and *combustible liquids* shall be removed from the tank and connected piping.~~
~~2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected.~~
~~3. The tank shall be filled completely with an approved inert solid material.~~
~~4. Remaining underground piping shall be capped or plugged.~~
~~5. A record of tank size, location and date of abandonment shall be retained.~~
~~6. All exterior above grade fill piping shall be permanently removed when tanks are abandoned or removed.~~

Justification: Abandoned tanks need to be removed to minimize the risk of environmental damage.

5704.5

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.

Justification: This amendment requires UL tanks with secondary containment and separation of tanks per NFPA 30.

5706.2.4.4

5706.2.4.4 Locations where above-ground tanks are prohibited. The storage of class I, ~~and~~ II, and III liquids in above-ground tanks outside of buildings is prohibited. ~~within the limits established by law as the limits of districts in which such storage is prohibited. (see Section 3 of the Sample Ordinance for Adoption of the International Fire Code on page v).~~

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

Justification: This amendment establishes approval authority for above-ground tanks.

5706.5.1.6

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

Justification: The intent of this amendment is to ensure that loading areas have fire protection. Dispensing of liquids can be hazardous, so the increased protection is warranted. Due to the outside temperatures possible in the Las Vegas valley, it is necessary to require this protection for Class II liquids as well as Class I liquids, since outside temperatures often exceed 100° F.

5706.5.4.5

***5706.5.4.5 Commercial, industrial, governmental or manufacturing.** Dispensing of ~~Class 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 permitted, provided such dispensing operations are conducted in accordance with the following:

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

*2 – 25 remain unchanged.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require that mobile fueling vehicles be permitted prior to dispensing fuel at mobile fueling sites.

5806.2

5806.2 Limitations. Storage of flammable *cryogenic fluids* in stationary containers outside of buildings is prohibited. ~~within the limits established by law as the limits of districts in which such storage is prohibited. (see Section 3 of the Sample Ordinance for Adoption of the International Fire Code on page v).~~

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

Justification This amendment establishes approval authority for cryogenic containers outside of buildings.

6104.2

6104.2 Liquefied petroleum gas storage containers. ~~**Maximum capacity within established limits.** Within the limits established by law restricting t~~The storage of liquefied petroleum gas ~~for the protection of heavily populated or congested areas the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L)~~ is prohibited.

> **Exception**: ~~In particular installations, this capacity limit shall be determined by the *fire code official*, after consideration of special features such a topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP-gas containers, degree of fire protection to be provided and capabilities of the local fire department.~~ When *approved* by the planning or zoning authority (in jurisdictions requiring this specific approval) and/or when *approved* by the *fire code official*.

Justification: This amendment establishes approval authority for LPG tanks.

6304.1.4

6304.1.4 Automatic sprinkler system. The automatic sprinkler system shall be designed in accordance with the 2010 edition of NFPA 400 ~~430.~~

Justification: NFPA 430 is discontinued. The information is now found in NFPA 400.

80

Chapter 80 REFERENCED STANDARDS, NFPA,

13- ~~10~~ 13 Installation of Sprinkler Systems.....Table 903.1.1, 903.3.2, 903.3.5.1.1, 903.3.5.2, 904.11, 905.3.4, 907.6.3, 1009.3, 3201.1, 3204.2, Table 3206.2, 3206.9, 3207.2, 3207.2.1, 3208.2.2, 3208.2.2.1, 3208.4, 3210.1, 3401.1, 5104.1, 5106.5.7, 5704.3.3.9, Table 5704.3.6.3(7), 5704.3.7.5.1, 5704.3.8.4

13D- ~~10~~ 13 Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes 903.3.1.3, 903.3.5.1.1

13R-~~10~~ 13 Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height 903.3.1.2, 903.3.5.1.1, 903.3.5.1.2, 903.4

14-~~10~~ 13 Installation of Standpipe and Hose Systems 905.2, 905.3.4, 905.4.2, 905.6.2, 905.8

20-~~10~~ 13 Installation of Stationary Pumps for Fire Protection 913.1, 913.2, 913.5.1

22-~~03~~ 08 Water Tanks for Private Fire Protection.....507.2.2

54-06 National Fuel Gas Code

72-~~10~~ 13 National Fire Alarm Code .....508.1.5, Table 901.6.1, 903.4.1, 904.3.5, 907.2, 907.2.6, 907.2.9.3 907.2.11, 907.2.13.2, 907.3, 907.3.3, 907.3.4, 907.5.2.1.2, 907.5.2.2, 907.6, 907.6.1, 907.6.2, 907.6.5, 907.7, 907.7.1, 907.7.2, 907.8, 907.8.2, 907.8.5, I101.1

140-08 Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations... 322

Justification: Add NFPA 54, National Fuel Gas Code and NFPA 140 to the IFC, Chapter 80, Referenced Standards, to allow for the use of this code for fuel gas piping systems, appliances, and equipment, and amend edition year of NFPA 13, 13D, 13R, 14, 20, 22, and 72.

Appendix B

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* shall be as specified in Table B105.1.

> **Exception:** For buildings other than high-rise buildings, a ~~A~~ reduction in required fire flow of up to 50 ~~75~~ percent, as *approved*, is allowed when the building is provided with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. A reduction in the required fire flow of up to 25 percent is permitted in high-rise buildings. The resulting fire flow shall not be less than 1,500 gallons per minute (95678 L/min) for the prescribed duration as specified in table B105.1.

Justification: The purpose of this amendment is to lessen the available fire-flow reductions. The reduction for the majority of buildings will be reduced from 75% to 50%. For high-rise buildings, a 25% reduction is permitted. This is to ensure that sufficient fire flow is available for commercial buildings.

Appendix C

Delete Existing Appendix C Text and Replace with the Following:

Section C101

General

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

Section C102

Location

C102.1 Fire hydrant locations. Fire hydrants shall be provided along required fire apparatus access roads

C102.2 Intersections. The spacing of fire hydrants shall start by placing fire hydrants at all intersections.

C102.3 R-3 Occupancies and single-family dwellings built under the IRC. In all residential areas (R-3 occupancies and single-family dwellings built under the IRC only), hydrants shall be spaced not to exceed 500 feet, or 600 feet if all homes are protected by approved automatic fire sprinkler systems.

C102.4 Distance from Hydrant to R-3 Occupancy and single-family dwelling built under the IRC. The maximum distance from a one- or two-family dwelling to a fire hydrant shall not exceed 300 feet, as measured from an approved point on a street or road frontage to a fire hydrant. An approved point is defined as the property line furthest from the hydrant, at a right angle to the street.

C102.5 Commercial and Residential Occupancies other than R-3 and single-family dwelling built under the IRC. In all commercial and industrial areas, including multi-family R-1 and R-2 occupancies, hydrants shall be spaced not to exceed 300 feet, or 400 feet if all buildings are protected by approved automatic sprinkler systems.

C102.6 Distance to Dead-End Street. The maximum distance from a hydrant to the end of a dead-end street shall not exceed 200 feet.

C102.7 Distance to a Fire Department Connection (FDC). The maximum distance from a fire hydrant to a fire department connection (FDC) supplying fire sprinklers and/or standpipes shall not exceed 100 feet, as measured by an approved route. An approved route is defined as an unobstructed path of travel on which hose can easily be laid.

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

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

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

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

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

Section C103

Approved Fire Hydrants

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

Section C104

Supply and Underground Mains

C104.1 Supply points. Two sources of water supply are required whenever 4 or more fire hydrants and/or sprinkler (per Section 903.3.1.1 and/or 903.3.1.2) lead-ins are installed on a single system.

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. For systems permitted to have one source of water supply per C104.1, sectional control valves shall be installed so that no more than 3 fire hydrants and/or fire sprinkler (per Section 903.1.1 and/or 903.3.1.2 only) lead-ins can be out of service due to a service interruption.

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

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

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

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

Section C105

Satisfying Fire Flow Requirements

(in Accordance with Appendix B)

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

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

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

Section C106

Construction Operations

C106.1 Construction Hydrants. Hydrants shall be provided for construction in accordance with Section 3312.

C106.2 Placing hydrant out of service. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Department prior to placing the hydrant out of service.

Section C107

Hydrant Markings

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

C107.2 Hydrant Marking Maintenance. Hydrant marking shall be maintained in accordance with Section 507.

Justification: This amendment is made to consolidate civil improvement utility code requirements into one area. This section sets forth many of the requirements that have been existing in these jurisdictions for many years.

Appendix K

Appendix K

Proprietary Supervising Station Facilities

Section K101

General

K101.1 Scope. Proprietary supervising station facilities (self-monitoring facilities) shall meet all of the requirements of this appendix.

K101.2 Permit Required. The proprietary supervising station facility shall maintain an annual operational permit.

Section K102

Site Requirements

K102.1 Location. The proprietary supervising station shall be located in a property's Fire Command Center, or other approved location.

K102.1.1 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 K104.

K102.2 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 K103

Personnel

K103.1 Qualifications. Proprietary supervising stations shall be operated by trained personnel in constant attendance who are responsible to the owner of the protected property.

K103.1.1 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*.

K103.2 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 K104 for the facility.

K103.3 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.

Section K104

Standard Operating Procedures

K104.1 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.
4. The following procedures if a positive alarm sequence is provided:

a. Describe whether positive alarm sequencing is to be utilized, whether an evacuation message will be played, or whether an investigation message will be played for the first 180 seconds after the receipt of a fire alarm signal.
b. Describe that an evacuation message will automatically activate per the fire alarm operational matrix after 180 seconds if the fire alarm system has not been reset.

Section K105

Disposition of Signals

K105.1 Alarm signals. Upon receipt of a fire alarm signal, the proprietary supervising station operator shall initiate action to perform the following:

1. Immediately dispatch 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.
    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.

K105.2 Supervisory signals. Upon receipt of a supervisory signal, the proprietary supervising station operator shall initiate action to perform the following:

1. Immediately dispatch runner to the location identified on the fire alarm control unit, unless the supervisory conditions are promptly restored.
2. If unable or unqualified to clear the supervisory signal, then personnel shall contact a fire alarm contractor within two hours to service the fire alarm system.
3. Notify the *fire code official* when sprinkler systems are wholly or partially out of service for eight hours or more.
4. Provide written notice to the *fire code official* as to the nature of the signal, time of occurrence, and restoration of service, when equipment has been out of service for eight hours or more.

K105.3 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 initiate action to perform the following, if required:

1. Immediately dispatch runner to the location identified on the fire alarm control unit, unless the trouble conditions are promptly restored.
2. If unable or unqualified to clear the trouble signal, then personnel shall contact a fire alarm contractor within four hours to service the fire alarm system.
3. Notify the *fire code official* when interruption of service exists for four hours or more.
4. When equipment has been out of service for eight hours or more, provide written notice to the *fire code official* as to the nature of the signal, time of occurrence, and restoration of service.

Section K106

Record-Keeping

K106.1 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.

Justification: Southern Nevada has very large and unique facilities that desire to provide self-monitoring. The fire departments would also benefit because having facilities provide self-monitoring can significantly reduce the number of false and nuisance alarms that they would respond to. This appendix was created as a result of this desire. The requirements set forth in this appendix are a combination of requirements from NFPA 72, the IFC, local guidelines, and local past practices that are desired to be codified.

Appendix L

Appendix L

FIRE PROTECTION SYSTEMS – IMPAIRMENTS AND SYSTEMS OUT OF SERVICE

Section L101

IMPAIRMENT PROCEDURES

L101.1 General. In addition to the requirements of Section 901.7 alternative protection measures shall be provided in accordance with this Appendix. Tables L102.1 (a) and L102.1 (b) shall be used by the impairment coordinator to determine the alternative protection measurers required.

L101.2 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.

L101.3 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 L102.1(a) and L102.1(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.

L101.4 Impairment Procedure Tables. The impairment coordinator shall comply with impairment tables Tables L102.1 (a) and L102.1 (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.

L101.4.1 Notify Dispatch. When required by Tables L102.1 (a) and L102.1 (b) the impairment coordinator shall notify the Fire Department dispatch center and fire code official.

L101.4.2 Fire watch. When required by Tables L102.1 (a) and L102.1 (b) the impairment coordinator shall institute a fire watch within the building area where fire protection is impaired for the duration of the impairment. Fire watch shall be in accordance with the Fire Watch Guideline. Fire watch personnel shall be provided at a rate of 1 person per 100,000 square feet of building area, over the entire area of the building affected by the impairment. Fire watch personnel shall meet the following characteristics:

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

L101.4.3 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.

L102

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

L102.1 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 measurers 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 L102.1 (a) and L102.1 (b) to address impairments to fire protection systems. When alternative protection measures are required by tables L102.1 (a) and L102.1 (b) the *Fire Code Official* shall be contacted.

TABLE L102.1(a)

SUPPRESSION-BASED SYSTEMS – USE GROUPS A, E, H, I, R

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
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

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hour	N	N
		> 3 hour	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	1	≤ 10 hours	N	N
		> 10 hours	N	Y

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
and tank	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 6 hour	N	N
		> 6 hour	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 6 hours	N	N
		> 6 hours	N	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (system still operational)	1	≤ 6 hours	N	N
		> 6 hours	Y	N
	2-5	≤ 4 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 4 hours	Y	N
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	N
Sprinkler System Repair/Sprinkler System out of Service	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler	1	≤ 10 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
system inside the space)		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	Y	N
Clean-agent (without sprinkler system inside the space)	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 4 hours	Y	Y

TABLE L102.1(b)

FIRE-ALARM SYSTEMS – USE GROUPS A, E, H, I, R

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Main FACU Not Operational (No Stand-alone Nodes)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Main FACU Not Operational	1	≤ 5 hours	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
(Stand-alone Nodes are available)		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Node FACU panel is down	1	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 5 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single notification circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	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 and fire alarm systems still operational)	1	≤ 12 hours	N	N
		> 12 hours	Y	Y
	2-5	≤ 12 hours	N	N
		> 12 hours	Y	Y
	6 or more	≤ 12 hours	N	N
		> 12 hours	Y	Y
Ground Fault	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	6 or more	≤ 5 hours	N	N
		> 5 hours	Y	N
Single Notification Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single Detection Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Automatic Doors not Releasing	1	≤ 2 hours	N	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Automatically		> 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 works)	NA	NA	N	Y
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

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

L103

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

L103.1 Use Groups B, F, M, S. Groups B, F, M and S Occupancies are considered lower hazard occupancies. As such, the impairment guideline is tailored to manage the risks associated with those occupancies. Mitigation shall be in accordance with Table L103.1(a) and Table L103.1(b).

TABLE L103.1(a)

SUPPRESSION-BASED SYSTEMS – USE GROUPS B, F, M, S

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
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 hour	Y	N
		> 2 hour	Y	Y
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 10 hours	N	Y
	6 or more	≤ 10 hours	N	N
		> 10 hours	N	Y
Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hour	Y	N
		> 2 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	≤ 8 hours	N	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 8 hours	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (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	1	≤ 10 hours	Y	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Repair/Sprinkler System out of Service		> 10 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler system inside the space)	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 8 hours	Y	N
Clean-agent (without sprinkler system inside the space)	1	≤ 8 hours	Y	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Water storage tank (including	1	≤ 5 hours	Y	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply		> 5 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

TABLE L103.1(b)

FIRE ALARM SYSTEMS – USE GROUPS B, F, M, S

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
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

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 4 hours	Y	N
		> 4 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Single alarm circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler and fire alarm systems still operational)	1	≤ 24 hours	N	N
		> 24 hours	Y	Y
	2-5	≤ 24 hours	N	N
		> 24 hours	Y	Y

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	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

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Automatic Doors not Releasing Automatically	1	≤ 2 hours	N	N
		> 2 hours	N	Y
	2-5	≤ 2 hours	N	N
		> 2 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	Y
Smoke Control Panel (automatic mode works)	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Smoke Control Panel (automatic mode does not works)	NA	NA	N	Y

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

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

NFPA 10

6.1.3.2

6.1.3.2 Fire extinguishers shall be located along normal paths of travel, including exits from areas, unless the *fire code official* determines that the hazard posed indicates the need for placement away from normal paths of travel.

Justification: This amendment is to correlate with the requirements set forth in the IFC Section 906.5.

6.1.3.10.1

6.1.3.10.1 Cabinets housing fire extinguishers shall not be locked~~., except where fire extinguishers are subject to malicious use and cabinets include a means of emergency access.~~

Exceptions:

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

Justification: This amendment is to correlate with the requirements set forth in the IFC Section 906.8.

6.2.1.3.1.1

6.2.1.3.1.1 Up to two water-type extinguishers, each with 1-A rating, shall be permitted to be used to fulfill the requirements of one 2-A rated extinguisher~~.~~ for light (low hazard) occupancies only.

Justification: This amendment is to correlate with the requirements set forth in the IFC Table 906.3(1).

6.6.3

6.6.3 All solid fuel cooking appliances (whether or not under a hood) with fire boxes of 5 ft^3 (0.14 m^3) volume or less shall have ~~at least have a listed 2-A rated water-type fire extinguisher or 1.6 gal (6 L) wet chemical fire extinguisher listed for Class K fires.~~ a minimum 2.5 gallon (9 L) or two 1.5 gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with the IFC Section 904.11.5.

Justification: This amendment is to correlate with the requirements set forth in the IFC Section 904.11.5.1.

6.6.4

6.6.4 When hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows:

(1) For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: One Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity.
(2) For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: One additional Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity shall be provided.
(3) For individual fryers exceeding 6 square feet (0.55 m^2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

Justification: This amendment is to correlate with the requirements set forth in the IFC Section 904.11.5.2.

NFPA 13

5.3.2

5.3.2.1 Ordinary Hazard (Group 2) Ordinary hazard (Group 2) occupancies shall be defined as occupancies or portions of other occupancies where the quantity and combustibility of contents is moderate to high, where stockpiles of contents with moderate rates of heat release do not exceed 12 ft (3.66 m), and stockpiles of contents with high rates of heat release do not exceed 8 ft (2.4m).

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

Justification: This amendment intends to specify that casino floor areas, mini-storage facilities, and shell buildings of unknown use, shall be considered Ordinary Hazard Group II areas. For Casinos, traditionally the State Fire Marshal has required in their code that Casinos be considered Ordinary Hazard Group II. Due to the fire load that can be present in casino areas, this design is justified. The only item to address with casinos would be to ensure that the sprinklers are of quick-response type, due to the type of occupant loading in casinos. For mini-storage facilities, the designation of Ordinary Hazard Group II is more than warranted. There is no restriction that can be enforced on users in mini-storage facilities, and therefore the fire load can be significant in these buildings. Finally, with shell buildings of unknown use, these are commonly use for office or retail purposes. While office use only requires a light hazard system, retail uses would require Ordinary Hazard Group II systems. In order to ensure that the system can accommodate future use, it is necessary to require ordinary hazard systems for shell buildings.

6.1.3

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

Justification: This amendment intends to require higher pressure ratings for underground lines that can be fed by FDC. Delivery of water at FDC can cause pressures that exceed 150 psi. Typically, use of 200 psi rated line can withstand the pressures delivered at the FDC. However, when higher pressures are required at the FDC due to system demands, the underground line is required to be listed for 50 psi above that demand pressure. The 50 psi above design pressure is to allow for pipe to be listed for the pressure used during the hydrostatic test.

6.2.9.7.1

6.2.9.7.1 The list shall be on a machine-engraved metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font and include the following:

(1) Sprinkler Identification Number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating.

(2) General description.

(3) Quantity of each type to be contained in the cabinet.

(4) Issue or revision date of the list.

Justification: The intent of this proposal is to require professionally engraved signs to be used for the sprinkler cabinet sign. For years, these plates have been installed as a sticker using permanent marker or a metal plate using a scribing tool. The areas where this cabinet is usually placed on a property are generally dusty and/or exposed to the extreme heat of the Las Vegas Valley. Our findings have shown that permanent marker is good for less than five (5) years when these are regularly exposed to these conditions. Two other problems are consistently noted with these plates being installed with permanent marker or a scribing tool. The first deals with those written in permanent marker. Not everyone prints well and the information required often cannot be written small and legibly enough with a permanent marker or a scribing tool to make the information permanently readable. The other deals with the scribing tools and the fact that most scribing tools give very thin lines that again are not readable. People often make mistakes with these also which leads to other issues with their readability.

6.3.1.1.2

6.3.1.1.2 Pipe or tube shall have a minimum Corrosion Resistant Ratio (CRR) of 1.

Justification: The purpose of this amendment is to require that the thickness of the sprinkler pipe is such that the pipe is resistant to internal corrosion. With the water hardness prevalent in the valley, it is necessary to require the thicker pipe walls. The CRR of 1 is also used in NFPA 13 Section 8.16.4.2.2. It is used here so that the requirement is associated with other requirements for installation of sprinkler pipe.

6.8.1.4

6.8.1.4 The minimum number of required inlets shall be one 2 ½ inch inlet for every 250 gpm of the sprinkler and/or standpipe demand, or fraction there of. Fire Department Connections (FDC) 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 purposes of this section, internal clapper valve devices provided by the manufacturer in listed FDC shall be considered internal check valves.

Justification: This amendment intends to require that multiple FDC inlets be provided in order to deal with larger system demands. Use of the 250 gpm per inlet follows from specification sheets of major FDC manufacturers. The intent of the requirement for FDC design to allow flow into one or more inlets, and not necessarily all inlets simultaneously, is to address shop-made FDC's consisting of multiple single-snoot inlets on main piping. There is a need to require that such FDC's are installed in a manner that if the responding engine only ties into one or two FDC inlets, all of the water being delivered by the engine will enter into the system, and not be allowed to come back out of the other inlets. The use of FDC caps to maintain water is not permitted. The committee feels that the preferred method for shop-fabricated FDC's will be to install a check valve behind each single snoot FDC to achieve code compliance. Manufacturer FDC connections with internal clapper valves are seen to meet the intent of this amendment

6.9.1

6.9.1 General. Waterflow alarm devices shall be listed for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler of the smallest K-factor installed on the system will result in an audible alarm on the premises ~~within~~ no less than 15 seconds and no greater than 60 seconds ~~5 minutes~~ after such flow begins and until such flow stops.

Justification: The amendment is provided to shorten the time from water flow to begin and for alarms to sound and be transmitted. A minimum time frame of 15 seconds is introduced to avoid false alarms due to water surges. This change increases the safety provided to building occupants, and quickens the response time that the fire service can provide to a fire emergency

7.1.3

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

Justification*:* This amendment intends to prohibit the installation of auxiliary deluge systems, to limit the size of auxiliary systems, and to allow auxiliary antifreeze systems. There has been recent increase in the use of this clause to allow large dry pipe systems for garden centers of home improvement stores, and this has caused situations where there are multiple flow alarms for a single incident. Multiple flow alarms cause confusion to responding personnel as to where to go to respond to fire flow. Deluge systems are required to have primary supply due to the fact that deluge systems are usually large in area, and therefore do not meet what is considered by the committee to be auxiliary. Also, different systems may have different maintenance requirements. Disabling a system because another system requires maintenance is not preferred. By limiting the size of the auxiliary system to 10% of the system area, the impact of the auxiliary system on the primary system is reduced.

7.2.3.1

7.2.3.1 The system capacity (volume) controlled by a dry pipe valve shall be determined by 7.2.3.2 or ~~, 7.2.3.3, 7.2.3.4~~, 7.2.3.5~~, or 7.2.3.7~~.

Justification: The amendment eliminates options to exceed time limit restraints on dry pipe systems. The result is that the time limit restraints that are contained in Section 7.2.3.2 and/or Table 7.2.3.6.1 shall be met for all dry pipe systems. The hazard of fire is the same regardless of system volume. The longer a fire is allowed to grow without suppression, the more difficult for the system to control the fire. The use of 30% increase in design may not be sufficient to handle an unlimited delay in discharge of water. In order to afford a consistent level of safety for all areas with dry pipe systems, the time restraint needs to be applied to all systems regardless of volume. By removing the allowances for exceeding the time constraints, this is achieved. The reference to 7.2.3.7 is removed in preparation of approval to the proposed amendment to 7.2.3.5, which will require satisfaction of both 7.2.3.5 and 7.2.3.7 simultaneously, rather than separate from each other as indicated in base Section 7.2.3.7.

A.7.2.3.1

~~**A.7.2.3.1** The 60-second limit does not apply to dry systems with capacities of 500 gal (1893 L) or less, nor to dry systems with capacities of 750 gal (2839 L) or less if equipped with a quick-opening device.~~

Justification: This deletion is necessary with the amendment to Section 7.2.3.1. The intent of Section 7.2.3.1 is to require a time limit restraint for all dry pipe systems, regardless of system size. This appendix material would conflict with that amendment, and thus needs to be deleted if the amendment to Section 7.2.3.1 is approved.

7.2.3.3

~~**7.2.3.3** A system size of not more than 500 gal (1893 L) shall be permitted without a quick opening device and shall not be required to meet any specific water delivery requirement to the inspection test connection.~~

Justification: This deletion is necessary with the amendment to Section 7.2.3.1. The intent of Section 7.2.3.1 is to require a time limit restraint for all dry pipe systems, regardless of system size. Section 7.2.3.3 would conflict with that amendment, and thus needs to be deleted if the amendment to Section 7.2.3.1 is approved.

7.2.3.4

~~**7.2.3.4** A system size of not more than 750 gal (2839 L) shall be permitted with a quick opening device and shall not be required to meet any specific water delivery requirement to the inspection test connection.~~

Justification: This deletion is necessary with the amendment to Section 7.2.3.1. The intent of Section 7.2.3.1 is to require a time limit restraint for all dry pipe systems, regardless of system size. Section 7.2.3.4 would conflict with that amendment, and thus needs to be deleted if the amendment to Section 7.2.3.1 is approved.

7.2.3.5

7.2.3.5 System size shall be based on dry systems being calculated for water delivery in accordance with 7.2.3.6. Testing of the system shall be accomplished by the methods indicated in 7.2.3.7.

Justification: This amendment requires that when a dry pipe system is designed by way of computer calculation, that a method of testing such system be provided. Such method of testing is indicated in Section 7.2.3.7. This amendment intends that the criteria of 7.2.3.7 be satisfied whenever the calculation method of 7.2.3.5 is proposed. The computer method is new and has not been field tested in this jurisdiction. In order to allow the new technology, verification of suitability is necessary. By providing a test of the system, with a method as prescribed in Section 7.2.3.7, the calculation method proposed in 7.2.3.5 can be accepted.

7.2.6.6.5

7.2.6.6.5 A high/low pressure supervisory signal to a constantly attended location shall be installed.

Justification: For years, dry pipe systems have utilized high/low pressure switches. The NFPA 72 standard still maintains the requirements for how to install such switches. However, the base NFPA 13 code does not clearly require the installation of such a switch. This amendment adds this requirement. For areas subject to freezing, this switch can prevent accidental filling of pipe and possible freezing of pipe. Further, this switch will help to avoid high air pressure within dry pipe systems, which can lead to longer delays in water delivery to a fire.

7.3.2.3.1.3

7.3.2.3.1.3 The system size for double-interlock preaction systems shall be based on calculating water delivery in accordance with 7.2.3.6, 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 7.2.3.7.

Justification: This amendment mirrors an amendment made for dry pipe systems. This amendment requires that when a dry pipe system is designed to meet a flow test per Table 7.2.3.6.1, then the design needs to be validated by a computer program. This amendment intends that a calculation be provided to satisfy 7.2.3.5 whenever a design proposes to utilize the criteria of 7.2.3.7, which are repeated for double interlock preaction systems in section 7.3.2.3.1.3. The time limits in Table 7.2.3.6.1 are new and not commonly used in this jurisdiction. In order to allow the new methodology, verification of design by computer analysis as discussed in 7.2.3.5 is necessary. By validating system design by computer analysis, the method proposed in 7.3.2.3.1.3 can be accepted during plan review.

7.6.2.3

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

Justification: The record measured low in the Las Vegas valley is 8° F. Understanding that temperatures vary from those that are recorded, it is prudent to select a temperature somewhat less than the low recorded temperature. This amendment defines the temperature for ease of design and review.

7.10.2.2

~~**7.10.2.2** Sprinklers or automatic spray nozzles in ducts, duct collars, and plenum chambers shall not be required where all cooking equipment is served by listed grease extractors.~~

Justification: The base code allows for the deletion of protection in the duct and plenum when listed grease extractors are used. The efficiency of grease extractors is not seen by the committee to be such that this allowance is warranted. Therefore, the code section is deleted, thus requiring protection to be provided in the duct and plenum.

7.10.3.1

7.10.3.1 Unless the requirements of 7.10.3.2 or 7.10.3.4 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.

Justification: The purpose of this amendment is to require additional sprinkler protection in vertical exhaust ducts that penetrate multiple floor levels. With many installations in large facilities, the grease duct vertical riser can penetrate multiple floor levels. If the grease duct has horizontal offsets, then intermediate height sprinklers will occur at the top of each vertical riser. However, if the grease duct exhaust includes risers with no offsets, such risers could have heights of 100 feet or more, and have no protection other than one sprinkler at the top of the riser. The mechanical code has reduced the protection requirements for grease ducts, which justifies additional protection. For building service chutes, which can be considered of equal or even less hazard, more protection is required, in the form of sprinklers at alternate floor levels (see Section 22.15.2.2.1.4). This proposal seeks to use that same protection requirement for the sprinkler protection of the grease exhaust duct as is provided in 22.15.2.2.1.4.

7.10.9

7.10.9 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.

Justification: The fire sprinklers that are installed for protection of cooking equipment and duct take the place of traditional wet chemical systems. Traditionally, wet chemical systems are interlocked with the cooking equipment to cause shutdown of the supply to the cooking equipment. This amendment intends to require a separate dedicated riser with flow switch for the sprinklers protecting cooking equipment and duct.

8.2.4

8.2.4 When acceptable to the authority having jurisdiction, ~~M~~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.

Justification: It is assumed here that the term “multiple buildings” refers to separate structures, in terms of type of construction, structural systems, etc. The base code in 8.2.4 allows for one sprinkler system to serve what would

be considered separate buildings, so long as the buildings are attached by roof or wall structures. If the buildings are truly considered as separated structures, the systems should be separated to ensure that maintenance or work in one building does not cause the system to be disabled. Oftentimes, separate buildings are given separate base addresses. Having the riser from one address cover a building with a different address is not seen as appropriate. Further, in situations where a fire wall is provided to separate buildings, the base language for 8.2.4 would seem to allow both of the buildings to be served by the same fire riser. Again, in most cases, buildings that are truly separate are better served with separate sprinkler systems, regardless of whether the separate buildings share a roof or wall element. The proposal adds language that would require AHJ acceptance prior to permitting one sprinkler riser to serves multiple buildings.

8.2.6

8.2.6 For spaces of Group A, B, and/or M occupancies adjacent to and having public access exclusively through an adjacent assembly space or mall, such as casinos, covered mall buildings, and other similar uses, the spaces shall be provided with individual isolation control valves. For the purposes of this section, the isolation control valve does not define a separate sprinkler system, such that the overall size of the sprinkler system serving the space(s) and adjacent assembly spaces must meet size limitations of 8.2.1 when measured from the control valve located on the system riser.

Justification: The intent of this amendment is to require that spaces, including tenant spaces (in all of the various ownership configurations), adjacent to and having access from assembly or mall, such as covered malls, casinos, and other assembly areas, have individual auxiliary control valves. The intent is to allow remodel work to occur in the space within the demising walls, without concern for maintenance of the sprinkler system serving the rest of the adjacent areas. These retail/assembly spaces are seen as requiring significant shut down of sprinklers, due to the frequent changeover of space use. This amendment intends to provide continued sprinkler protection for the areas outside the space. This amendment is in line with language contained within the IFC for covered mall buildings. The scope is broadened in this amendment due to the fact that many “mall-like” areas within casino properties are not strictly defined as covered mall buildings, although the hazard is the same as for covered mall buildings. The amendment also indicates that this is an auxiliary valve, and not a separate system valve. Thus, the auxiliary valve does not define a separate sprinkler system, such that it is apparent that the size limitations of 8.2.1 cannot be circumvented by indicating the auxiliary valves create separate sprinkler systems

8.3.3.1

8.3.3.1 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 3.6.4.7

(2) Residential sprinklers in accordance with the requirements of 8.4.5

(3) Standard response sprinklers used for modifications or additions, within the existing compartment, to existing ~~light hazard~~ systems equipped with standard response sprinklers

(4) Standard response sprinklers used where individual standard response sprinklers are replaced in existing ~~light hazard~~ systems

Justification: The intent is to require quick-response sprinklers in all assembly spaces, regardless of whether such assembly spaces are classified as light hazard occupancies. Quick-response sprinklers provide greater life safety protection than standard response sprinklers. Although the systems proposed for casinos and exhibition spaces are not defined as light hazard occupancy systems, the need for life safety exists in these spaces, due to the fact

that they are assembly spaces. By specifically adding the terms “casinos” and “exhibition areas”, it is clear that the quick-response sprinkler requirement applies to those areas, even though the amendments may not define those spaces as light hazard occupancies. Further, this code intends to require quick response sprinklers in shell buildings of combustible construction. This is to ensure compliance with 8.15.1.3. In addition, the code is changed to allow the use of standard response heads only when an existing compartment is expanded, not just when the system is expanded. Therefore, new compartments may be required to have quick response sprinkler heads, regardless of the response type of existing heads on the sprinkler system. The strike-out of “light hazard” in items (3) and (4) are to indicate that items (3) and (4) apply to all occupancies in the charging statement, to include light hazard occupancies, casinos, and exhibition areas.

8.6.4.1.1.3

8.6.4.1.1.3 The requirements of 8.6.4.1.1.1 shall not apply for light and ordinary hazard occupancies with ceilings of noncombustible ~~or limited combustible~~ construction, as follows:

(**A**) Where there is a vertical change in ceiling elevation within the area of coverage of the sprinkler creates a distance of more than 36 in. (914 mm) between the upper ceiling and the sprinkler deflector, a vertical plane extending down from the ceiling at the change in elevation shall be considered a wall for the purpose of sprinkler spacing as shown in Figure 8.6.4.1.1.3(A).

(**B**) Where the distance between the upper ceiling and the sprinkler deflector is less than or equal to 36 in. (914 mm), the sprinklers shall be permitted to be spaced as though the ceiling was flat, provided the obstruction rules are observed as shown in Figure 8.6.4.1.1.3(B).

Justification: Base 8.6.4.1.1.3 is confusing in the manner in which it is written, particularly with the first sentence. The first sentence of 8.6.4.1.1.3 gives a blanket exception where compliance with 8.6.4.1.1.1 is not required for ceilings of noncombustible or limited combustible construction. Section 8.6.4.1.1.1 is the section that requires deflectors to be within 1-12 inches from the ceiling. With the first sentence, there is an express exception, such that the code seems to allow the deflectors to be more than 12 inches from the ceiling, so long as the ceiling is noncombustible or limited combustible. As the deflector distance is seen to be important to ensure quick operation of the sprinkler heads, and is not an issue with respect to the type of construction, then this exception does not seem to be appropriate

8.8.4.1.1.4

8.8.4.1.1.4 The requirements of 8.8.4.1.1.1 shall not apply for light and ordinary hazard occupancies with ceilings of noncombustible ~~or limited combustible~~ construction, as follows.

(**A**) Where there is a vertical change in ceiling elevation within the area of coverage of the sprinkler creates a distance of more than 36 in. (914 mm) between the upper ceiling and the sprinkler deflector, a vertical plane extending down from the ceiling at the change in elevation shall be considered a wall for the purpose of sprinkler spacing.

(**B**) Where the distance between the upper ceiling and the sprinkler deflector is less than or equal to 36 in. (914 mm), the sprinklers shall be permitted to be spaced as though the ceiling was flat, provided the obstruction rules and ceiling pocket rules are observed.

Justification: This is a companion amendment to one for section 8.6.4.1.1.3, which is a similar code section. Base 8.8.4.1.1.4 is confusing in the manner in which it is written, particularly with the first sentence. The first sentence of 8.8.4.1.1.4 gives a blanket exception where compliance with 8.8.4.1.1.1 is not required for ceilings of noncombustible or limited combustible construction. Section 8.8.4.1.1.1 is the section that requires deflectors to be within 1-12 inches from the ceiling. With the first sentence, there is an express exception, such that the code seems to allow the deflectors to be more than 12 inches from the ceiling, so long as the ceiling is noncombustible or limited combustible. As the deflector distance is seen to be important to ensure quick operation of the sprinkler heads, and not an issue with respect to the type of construction, then this exception does not seem to be appropriate

8.14.6

8.14.6 Pilot line detectors shall be permitted to be spaced more than 22 in. (559 mm) below a ceiling or deck where the maximum spacing between pilot line detectors is 10 ft (3 m) or less, and where such spacing is supported by an engineering analysis discussing sprinkler temperature and response rating, plume diameter, temperature within the plume that will pass across the sprinklers, and the expected fire size required to activate the pilot sprinklers.

Justification: The base code allows pilot line detectors (sprinklers) to be located an unlimited distance below a ceiling, as long as the pilot sprinklers are spaced at 10 feet or less. When the distance from the ceiling is increased, the pilot sprinklers are no longer expected to be activated by the ceiling jet, but rather by heat within the fire plume. Fire plume have been determined to have two diameters. One is the visible diameter, which is where smoke is expected to be visible. The other is the effective heat diameter, where significant heat from the plume is expected. Roughly, the visible diameter is expected to be one-half the height of analysis, and the effective heat diameter is expected to be one-half the visible diameter. Therefore, if pilot sprinklers are located 32 feet above the floor, the effective heat diameter would be approximately 8 feet, which is smaller than the 10 feet spacing, and could lead to no activation of the pilot sprinklers. In addition, the temperature of the plume decreases the higher the plume rises, to the point where there would be little difference in temperature between smoke and ambient for small fires with tall ceilings. Therefore, there would be a point where even if the effective heat diameter is greater than 14 feet, the heat inside that diameter would not be sufficient to activate sprinklers. The process of activating sprinklers where there is no ceiling is difficult to analyze, but is necessary to ensure that the system will work as designed. For discussion about heat and visible diameter, see Klote/Milke, *Design of Smoke Management Systems*

*8.15.1.2.1**

8.15.1.2.1* Concealed spaces of noncombustible ~~and limited combustible~~ construction with minimal combustible loading having no access shall not require sprinkler protection. For purposes of this section, “construction” is limited to wall assemblies, floor assemblies, ceiling assemblies, and structural members.

Justification: This amendment is intended to remove the term “limited-combustible”. The committee feels that allowing unprotected combustibles in concealed space is not warranted, and therefore wanted to maintain the existing amendment. Further, the committee provides language to define the term “construction”.

8.15.1.2.1.2

8.15.1.2.1.2 Minor quantities of combustible materials limited to: cabling, nonmetallic piping conveying non-combustible liquids, and nonmetallic HVAC ductwork as expressly allowed by the current adopted building code, shall be permitted in concealed spaces constructed of non-combustible materials and shall not require sprinklers.

Justification: The committee desired to provide guidance as to what combustible materials are allowed in noncombustible concealed spaces. Currently, there are instances where building codes allow some combustible materials for building services in concealed spaces, where currently adopted sprinkler codes are interpreted to require sprinklers in the concealed spaces. This amendment intends to allow concealed spaces to have these combustible materials, which must be allowed by the building code, to be present in the concealed space without requiring fire sprinkler protection in that space.

8.15.1.2.2

8.15.1.2.2 Concealed spaces of non-combustible ~~and limited-combustible~~ construction with limited access and minimal combustible loading and not permitting occupancy or storage of combustibles shall not require sprinkler protection. For the purposes of this section, limited access does not include access to catwalks and mechanical mezzanines. Catwalks and mechanical mezzanines require sprinkler protection, which may be designed in accordance with *Localized Protection of Exposed Combustible Construction or Combustibles*, Section 8.15.1.5. Additionally, "construction" is limited to wall assemblies, floor assemblies, ceiling assemblies, and structural members.

Justification: This is partly an amendment to remove the term "limited-combustible". Also, this amendment intends to resolve what limited access means. In this interpretation, limited access means that openings into the concealed space are allowed, but such openings can not provide access to large open spaces on catwalks and mechanical mezzanines. Further, the committee felt that adding the allowance for minimal combustible loading to this section is warranted, as the committee does not feel that the hazard in spaces with limited access is substantially different than the hazard in non-accessible areas as described in section 8.15.1.2.1. Finally, the committee adds language providing definition of the term "construction".

8.15.1.2.10

~~**8.15.1.2.10** Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.~~

Justification: This amendment intends to delete the allowance of materials in unprotected concealed spaces due solely to a test for flame spread. There is considerable data that flame spread tests may not be appropriate tests for measuring the burning hazard of many plastics. Many plastics receive a flame spread rating of less than 25, yet exhibit melting of material, flaming droplets to the bottom of the test chamber, and continued burning at the bottom of test chamber. Note that this amendment does not specify a smoke developed rating, and therefore plastic materials that may not ordinarily be considered to be Class A materials could be allowed by this code section to be installed in unprotected concealed spaces. The term "rigid" is not seen to restrict materials. There is no definition for the term set forth in this code, and many plastic materials would rightly be considered to be rigid by standard definitions. Due to the possibility that this amendment could allow plastic materials in unprotected concealed spaces, it is recommended that this code section be deleted.

8.15.1.2.11

~~8.15.1.2.11 Concealed spaces in which the exposed materials are constructed entirely of fire-retardant treated wood as defined by NFPA 703, *Standard for Fire Retardant Treated Wood and Fire Retardant Coatings for Building Materials*, shall not require sprinkler protection.~~

Justification: This amendment intends to delete the use of wood in concealed spaces without fire sprinkler protection. Fire-retardant treated wood has the capacity to burn, and the base code has no limit as to how much wood is allowed in the unprotected concealed space, nor is there a limit as to whether this wood could comprise a structural member for the building. As such, this amendment intends to remove the allowance for fire-retardant wood to be installed in unprotected concealed spaces.

8.15.1.2.16

8.15.1.2.16 Concealed spaces formed by noncombustible ~~or limited-combustible~~ ceilings suspended from the bottom of wood joists, composite wood joists, wood bar joists, or wood trusses that have insulation filling all of the gaps between the bottom of the trusses or joists, and where sprinklers are present in the space above the installation within the trusses or joists, shall not require sprinkler protection.

Justification: This amendment is to delete the term "limited-combustible". The committee feels that concealed areas of limited-combustible construction can still support fire, and thus requires those areas to be provided with sprinkler protection.

8.15.1.2.17

8.15.1.2.17 Concealed spaces formed by noncombustible ~~or limited-combustible~~ ceilings suspended from the bottom of wood joists and composite wood joists with a maximum nominal chord width of 2 in. (50.8 mm), where joist spaces are full of noncombustible batt insulation with a maximum 2 in. (50.8 mm) air space between the roof decking material and the top of the batt insulation shall not require sprinklers.

Justification: This amendment is to delete the term "limited-combustible". The committee feels that concealed areas of limited-combustible construction can still support fire, and thus requires those areas to be provided with sprinkler protection.

8.15.1.2.17.1

8.15.1.2.17.1 Facing that meets the requirements for noncombustible ~~or limited-combustible~~ material covering the surface of the bottom chord of each joist and secured in place per the manufacturer's recommendations shall not require sprinklers.

Justification: This amendment is to delete the term "limited-combustible". The committee feels that concealed areas of limited-combustible construction can still support fire, and thus requires those areas to be provided with sprinkler protection.

8.15.4.1

8.15.4.1 General. Unless the requirements of 8.15.4.4 are met, where moving stairways, staircases, or similar floor openings are unenclosed and where sprinkler protection is serving as the alternate to enclosure of the vertical opening, the floor openings involved shall be protected by closely spaced sprinklers supplied by a dedicated sprinkler riser in combination with draft stops in accordance with 8.15.4.2 and 8.15.4.3

Justification: The intent of this amendment is to require that the sprinklers used in lieu of passive protection be on a system that is separate from adjacent overhead sprinkler systems. The passive protection is seen as redundant protection to that provided by overhead sprinkler protection, and is only necessary when the overhead sprinkler system is not functioning properly. Since the sprinklers described in this section are meant to replace the passive protection, it is prudent to require these sprinklers to be fed from separate risers. This way, if the overhead sprinkler system is not functioning properly for some reason, there is a chance for the closely spaced sprinklers to act as the redundant system which it intends to replace.

8.15.5

8.15.5 Elevator Hoistways and Machine Rooms.

8.15.5.1* Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft (0.61 m) above the floor of the pit.

8.15.5.2 The sprinkler required at the bottom of the elevator hoistway by 8.15.5.1 shall not be required for enclosed, noncombustible elevator shafts that do not contain ~~combustible~~ hydraulic fluids.

8.15.5.3 Automatic fire sprinklers shall not be required in elevator machine rooms, elevator machinery spaces, control spaces, or hoistways of traction elevators installed in accordance with the applicable provisions in NFPA *101*, or the applicable building code, where all of the following conditions are met:

(1) The elevator machine room, machinery space, control room, control space, or hoistway of traction elevator is dedicated to elevator equipment only.
(2) The elevator machine room, machine room, machinery space, control room, or control space, ~~or hoistway of traction elevators~~ are protected by smoke detectors, or other automatic fire detection, installed in accordance with *NFPA 72*.
(3) The elevator machinery space, control room, control space, or hoistway of traction elevators is separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire resistance rating of not less than that specified by the applicable building code.
(4) No materials unrelated to elevator equipment are permitted to be stored in elevator machine rooms, machinery spaces, control rooms, control spaces, or hoistways of traction elevators.
(5) The elevator machinery is not of the hydraulic type.

8.15.5.4* Automatic sprinklers in elevator machine rooms or at the tops of hoistways shall be of ordinary- or intermediate temperature rating.

8.15.5.5* Upright, pendent, or sidewall spray sprinklers shall be installed at the top of elevator hoistways.

8.15.5.6 The sprinkler required at the top of the elevator hoistway by 8.15.5.5 shall not be required where the hoistway for passenger elevators is noncombustible or limited-combustible and the car enclosure materials meet the requirements of ASME A17.1, *Safety Code for Elevators and Escalators*.

Justification: This amendment ensures that sprinklers are added for the bottom of the shaft for all hydraulic elevators. Further, this amendment addresses a code conflict with NFPA 72, by removing a requirement to have smoke detection to an unsprinklered hoistway.

8.15.7.1

8.15.7.1 Unless the requirements of 8.15.7.2~~, 8.15.7.3,~~ or 8.15.7.4 are met, sprinklers shall be installed under exterior projections exceeding 4 ft (1.2 m) in width

Justification: This is a companion amendment to the amendment proposing deletion of 8.15.7.3.

8.15.7.2

8.15.7.2 Sprinklers shall be permitted to be omitted where the exterior projections are constructed entirely with materials that are noncombustible~~, limited-combustible, or fire-retardant treated wood as defined in NFPA 703~~, and where the exterior projections do not support occupancy above.

Justification: This amendment will allow the omission of fire sprinklers for exterior roof/canopies/porte-cocheres that are entirely of non-combustible construction, unless the roof/canopy/porte-cochere supports occupancy above. There is a difference between a steel cantilevered use with nothing above the roof, and a concrete ceiling/floor assembly that allows occupancy above. This amendment intends that where occupancy is supported by the roof/canopy/porte-cochere, then the area below the roof/canopy/porte-cochere is to be protected with fire sprinklers

8.15.7.3

~~**8.15.7.3** Sprinklers shall be permitted to be omitted from below the exterior projections of combustible construction, provided the exposed finish material on the exterior projections are non-combustible, limited-combustible, or fire retardant treated wood as defined in NFPA 703, and the exterior projections contain only sprinklered concealed spaces or any of the following unsprinklered combustible concealed spaces:~~

~~(1) Combustible concealed spaces filled entirely with non-combustible insulation.~~
~~(2) Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached to the bottom of solid wood joists so as to create enclosed joist spaces 160 ft³ (4.5m³) or less in volume, including space below insulation that is laid directly on top or within the ceiling joist in an otherwise sprinklered attic [*see 11.2.3.1.4(4)(d)*]~~
~~(3) Concealed spaces over isolated small exterior projections not exceeding 55 ft² (5.1m²) in area.~~

Justification: The purpose of this amendment is to delete the allowance of omission of sprinklers under roofs of combustible construction. There is concern that a fire from a vehicle parked under the roof could burn into the combustible structure, and that fire could subsequently move through the structure of the adjacent building. There is concern about a fire entering a building in the roof structure area, and the performance of sprinklers when a fire occurs across combustible roof construction. There is recent past history within Southern Nevada of fire sprinklered buildings burning down because the fire was able to reach the roof structure above the sprinklers, and cause collapse of the roof structure, and subsequent loss of the building. This amendment is seen as necessary to avoid this type of situation in the future.

8.15.8.1.1

8.15.8.1.1 Sprinkler protection shall be provided in all bathrooms. ~~Sprinklers shall not be required in bathrooms that are located within dwelling units of hotels and motels, that do not exceed 55 ft² (5.1m²) in area, and that have walls and ceilings of noncombustible or limited-combustible materials with a 15-minute thermal barrier rating, including the walls and ceilings behind an shower enclosure or tub.~~

Justification: There is concern with the fire loading that is seen in bathrooms. The committee feels that exempting bathrooms from sprinkler protection is not warranted.

8.15.8.2

8.15.8.2 Closets and Pantries. Sprinkler~~s~~ protection shall be ~~are not required~~ provided in clothes closets, linen closets, and pantries. ~~within dwelling units in hotels and motels where the area of the space does not exceed 24 ft² (2.2 m²), the least dimension does not exceed 3 feet (0.9 m), and the walls and ceilings are surfaced with noncombustible or limited-combustible materials.~~

Justification: This amendment is intended to provide consistency for regional application of codes. The committee feels that exempting sprinklers from closets, which may have fire loading, is not warranted. Therefore, the committee chooses to maintain the existing amendment.

8.15.11.1

8.15.11.1 ~~Unless the requirements of 8.15.11.3 are met,~~ Ssprinkler protection shall be required in electrical equipment rooms.

Justification: This amendment is proposed as a companion to the amendment that deleted section 8.15.11.3. Since section 8.15.11.3 is deleted, then the portion of this section that refers to that section should also be deleted.

8.15.11.3

~~**8.15.11.3** Sprinklers shall not be required in electrical equipment rooms where all of the following conditions are met:~~

~~(1) The room is dedicated to electrical equipment only~~

~~(2) Only dry-type electrical equipment is used.~~

~~(3) Equipment is installed in a 2-hour fire-rated enclosure including protection for penetrations.~~

~~(4) No combustible storage is permitted to be stored in the room.~~

Justification: A building protected with a fire sprinkler system must have fire sprinklers throughout.

8.15.15.1

8.15.15.1 ~~Drop-out ceilings shall be permitted to be installed beneath sprinklers where ceilings are listed for that service and are installed in accordance with their listings.~~ Drop-out ceilings are not permitted to be installed beneath fire sprinklers.

Justification: This amendment intends to remove the allowance for use of drop-out ceilings below sprinklers. When ceiling tiles drop out, the ceiling jet is compromised. This could lead to a situation where no additional tiles are subject to heat, and thus too few tiles drop out to allow for full sprinkler protection. If too few tiles have dropped and the smoke plume goes through the ceiling to the level of sprinklers, the remaining tiles can be an obstruction to sprinkler discharge.

8.15.15.2

~~**8.15.15.2** Drop-out ceilings shall not be installed below quick-response or extended coverage sprinkler unless specifically listed for that application.~~

Justification: This is a companion amendment to the amendment for Section 8.15.15.1. If drop-out ceilings are not allowed by changes to Section 8.15.15.1, then this section also needs to be deleted.

8.15.15.3

~~**8.15.15.3** Drop-out ceilings shall not be considered ceilings within the context of this standard.~~

Justification: This is a companion amendment to the amendment for Section 8.15.15.1. If drop-out ceilings are not allowed by changes to Section 8.15.15.1, then this section also needs to be deleted.

8.15.15.4

~~**8.15.15.4** Piping installed above drop-out ceilings shall not be considered concealed piping.~~

Justification: This is a companion amendment to the amendment for Section 8.15.15.1. If drop-out ceilings are not allowed by changes to Section 8.15.15.1, then this section also needs to be deleted.

8.15.20.1.1

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

Justification: Each one-inch outlet can supply one sprinkler without affecting the hydraulic design of the existing sprinkler system, so there is no adverse effect on the existing system.

8.15.20.1.2

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

Justification: A one-inch outlet can supply two sprinklers when separated by a ceiling, walls and/or doors because it is anticipated that only one of the sprinklers will discharge at one time, and it will not adversely affect the system. Thus, if the one inch-outlet supplies a sprinkler head above the ceiling, then the outlet can supply a maximum of one additional head below the ceiling, with the ceiling providing the separation between separate sprinklered areas. If the one-inch outlet supplies no heads above the ceiling, then the one-inch outlet can supply a maximum of two heads below the ceiling, so long as those two heads are located in separate areas that are separated by walls and doors. This limitation of a maximum of two heads from 1-inch supply corresponds to the pipe schedule method. The maximum area of openings provision is adapted from NFPA 13R, with the intent of eliminating the practice of using a beam with depth greater than 8 inches to attempt to create a separate room.

8.15.20.1.3

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

Justification: Sections 8.15.20.1.1 and 8.15.20.1.2 require that sprinklers below the ceiling have the same k factor as heads above the ceiling. This is to allow heads below the ceiling to go in without hydraulic calculations. Heads of a lesser k factor may not be acceptable in all cases. For instance, if the water supply pressures are not sufficient to cover an occupancy with k=5.6 heads, the calculated design could use k=8.0 or larger heads. In this case, allowing k=5.6 heads to be installed under ceilings without calculations could lead to having insufficient pressure at the head for proper coverage. However, where the overhead system is designed for a higher classification type, a lesser k factor may be acceptable without calculations. For instance, where there is a warehouse with ESFR or other larger orifice heads, it is acceptable to handle areas such as office and bathroom additions, without requiring the office and bathroom heads to be ESFR or other large orifice head

8.15.20.1.4

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

Justification: This addresses the issue of flexible sprinkler drops that are added as part of tenant improvement or other work where the flexible sprinkler hose supplies heads below ceilings. Due to the equivalent length issues that

are characteristic of flexible sprinkler hose, it is necessary to require that systems using flexible sprinkler hose drops be proven by hydraulic calculation.

8.15.23.3

8.15.23.3 Where there is a noncombustible space above a noncombustible ~~or limited-combustible~~ drop ceiling that is sprinklered because it is open to an adjacent sprinklered space on only one side and where there is no possibility for storage above the drop ceiling, the sprinkler system shall be permitted to extend only as far into the space as 0.6 times the square root of the design area of the sprinkler system in the adjacent space.

Justification: This amendment is to delete the term "limited-combustible". The committee feels that concealed areas of limited-combustible construction can still support fire, and thus requires those areas to be provided with sprinkler protection without exceptions.

8.15.24

8.15.24 Openings in Rated Assemblies. Where sprinkler protection is serving as the alternative to opening protection in rated assemblies, such sprinklers shall be listed for use, and installed in accordance with their listing.

Justification: The purpose of this amendment is to ensure that sprinklers used as alternates for passive protection are listed for the purpose.

8.15.25

8.15.25 Temporary Exhibit Booths Within a Permanent Building. Where sprinkler protection is required in temporary exhibit booths constructed in a permanent building, such systems shall comply with Section 8.15.25.

8.15.25.1 Hydraulic Design. Systems shall meet Density/Area Method requirements of Section 11.2.3.2 or the Pipe Schedule method of Section 23.5. The minimum design shall be for Ordinary Hazard Group 2, or higher design to accommodate the hazard within the temporary exhibit booth

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

8.15.25.3 Hangers. Hangers conforming to Section 9.1 shall be provided for temporary piping to temporary exhibit booths. Hangers shall be permitted to be attached to the temporary exhibit booth structure.

8.15.25.4 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.

8.15.25.5 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.

Justification: The purpose of these amendments is to provide a reasonable approach to temporary sprinkler system installation in exhibit booths when required to be fire sprinklered by the Fire Code.

8.16.1.1.1.4

8.16.1.1.1.4 Valve rooms shall be lighted and heated.

Justification: This amendment is a copy of Section 7.2.5.2.1. Section 7.2.5.2.1 provides requirements for dry pipe valves, but the code does not provide the same requirements for other system valve rooms. This amendment would require that valve rooms be provided with light and heat

8.16.1.1.1.5

8.16.1.1.1.5 The source of heat shall be of a permanently installed type.

Justification: This amendment is a copy of Section 7.2.5.2.2. Section 7.2.5.2.2 provides requirements for dry pipe valves, but the code does not provide the same requirements for other system valve rooms. This amendment would require that the heating system for valve rooms be provided permanently installed. This would prohibit plug-in systems that can be easily removed after obtaining the Certificate of Occupancy.

8.16.1.1.1.6

8.16.1.1.1.6 Heat tape shall not be used in lieu of heated valve enclosures to protect the valve and supply pipe against freezing.

Justification: This amendment is a copy of Section 7.2.5.2.3. Section 7.2.5.2.3 provides requirements for dry pipe valves, but the code does not provide the same requirements for other system valve rooms. This amendment would prohibit the use of heat tape for providing heat for the system valve

8.16.1.1.2.1

8.16.1.1.2.1 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 ~~one of the following methods:~~

~~(1)~~ Central station, proprietary, or remote station signaling service

~~(2) Local signaling service that will cause the sounding of an audible signal at a constantly attended point~~

~~(3) Valves locked in the correct position~~

~~(4) Valves located within fenced enclosures under the control of the owner, sealed in the open position, and inspected weekly as part of an approved procedure~~

Justification: The purpose of this amendment is to indicate that sprinkler control valves are required to be electrically supervised, and that the other methods of supervision that are listed in base NFPA 13 are not permitted to be used for the purpose of supervision. This amendment brings NFPA 13 in compliance with the IFC requirements for electrical supervision.

8.16.1.1.2.3

8.16.1.1.2.3 The requirements of 8.16.1.1.2.1 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.

Justification: The purpose of this amendment is to exempt the requirement for supervision of valves for the valves that occur at the equipment at the connection from public to private water. Several types of devices are used, such as Double Check Detector Assembly, Reduced Pressure Principle Assembly, and Backflow Preventers. These devices all have the purpose of separating the private piping on a property from the public water supply, such that contaminants within the private system will not affect the public water supply. These devices are paid for and maintained by property owners, but are located on a public easement that allows the water purveyor access to the devices. Typically, new installations are secured within a protective box.

8.16.1.2.5

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

Justification: The purpose of this amendment is to prescribe a method for testing PRV control valves in fire sprinkler systems. This is a low-cost option that will allow for testing during construction and during maintenance testing. The designer is permitted to submit alternate methods for providing means to test the PRV, which can be approved by the AHJ if the alternate means provides the same ability to test both during construction and during maintenance.

8.16. 1.5

8.16.1.5 Floor Control Valve Assemblies.

8.16.1.5.1* Multistory buildings ~~exceeding two stories in height~~ shall be provided with a floor control valve, check valve, main drain valve, and flow switch for isolation, control, and annunciation of water flow on each floor level.

8.16.1.5.2 The floor control valve, check valve, main drain valve, and flow switch required by 8.16.1.5.1 ~~8.16.1.6.3~~ shall not be required where sprinkler systems protecting atriums, covered mall buildings, and other areas with non-standard ceiling heights within the building, ~~sprinklers on the top level of a multistory building~~ are supplied by piping from ~~on~~ the protected floor system below.

~~8.16.1.5.3 The floor control valve, check valve, main drain valve, and flow switch required by 8.16.1.6.3 shall not be required where the total area of all floors combined does not exceed the system protection area limitations of 8.2.1.~~

8.16.4.1.6

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

Justification: The intent of the amendment is to provide criteria for the calculation to prove that pipe does not require heat trace. There have been situations in the past where designers look to run wet system piping through unheated areas, and desire to not use heat trace. There are numerous calculation methods available, with numerous assumptions that need to be made in employing the available formulae. This amendment is provided to set reasonable assumptions that can be accepted by the AHJ

8.17.1.1

8.17.1.1. Local Waterflow Alarms Units. A local waterflow alarm unit shall be provided on every sprinkler system ~~having more than 20 sprinklers~~. Such waterflow alarm units shall be installed in accordance with 6.9.

Justification: This amendment intends to coordinate the requirements for local waterflow alarms that are described in Section 6.9 to the waterflow alarm that is discussed in Section 8.17.1.1. This is a companion to the proposals to Section 6.9, in order to ensure that code users know to look to Section 6.9 for required design of waterflow alarms. Further, this amendment removes the trigger of 20 sprinklers, in order to coordinate with the IFC, which requires an alarm to be connected to every sprinkler system.

8.17.2.3

8.17.2.3 Size. The size of the pipe for the fire department connection shall be in accordance with one of the following:

(1) Pipe size shall be a minimum of 4 in. (100 mm) for fire engine connections when the fire department connection has three or fewer 2-1/2 in (65 mm) inlets, and shall be a minimum of 6 in. (150 mm) for fire engine connections when the fire department connection has four or more 2-1/2 in (65 mm) inlets.
(2) Pipe size shall be a minimum of 6 in. (150 mm) for fire boat connections.
(3) For hydraulically calculated systems the fire department connection shall be permitted to be less than 4 in. (100 mm) and no less than the size of system riser, where serving one system riser.

Justification: This is a companion to the amendments regarding the number of inlets required for Fire Department Connections from section 6.9 where connections are sized due to flow rate of the system. The additional size of 6-inch for larger flow systems follows the sizes provided for manufactured connections. For 3-inlet fire department connections, the outlet can be found in both 4-inch and 6-inch. For 4-inlet connections, the outlet can be found in 6-inch only.

8.17.2.4.1.3

8.17.2.4.1.3 The fire department connection shall be located not less than 18 in (457 mm) and not more than 4 ft (1.2 m) above the level of the adjacent grade or access level.

Justification: The purpose of this amendment is to codify the language dictating the height of the fire department connection. The language used in this proposal comes from the annex to Section 8.17.2. Further, this code is repeated as code language in NFPA 14. Adding this as code language will assist with review and inspections of fire department connection installations

9.1.3.9.3

9.1.3.9.3 Powder-driven fasteners shall be allowed for branch lines less than or equal to 2 in. (50 mm) pipe. ~~Representative samples of concrete into which studs are to be driven shall be tested to determine that the studs will hold a minimum load of 750 lb (341 kg) for 2 in. (50 mm) or smaller pipe; 1000 lb (454 kg) for 2 ½ in., 3 in., 3 ½ in. (65 mm, 80 mm, or 90 mm) pipe; and 1200 lb (545 kg) for 4 in. or 5 in. (100 mm or 125 mm) pipe~~.

Justification: Powder-driven fasteners require special handling. Further, there are concerns about the ability of all concrete to meet these criteria, and the ability to conduct the required testing. There is concern about the quality of such systems for large diameter pipe. For that reason, the amendment is made to reduce the allowable pipe diameter to 2-inch.

9.1.3.9.4

9.1.3.9.4 Increaser couplings shall not be permitted with ~~be attached directly to the~~ powder-driven studs.

Justification: The base code allows smaller diameter studs to be used than the code would allow rod diameters to be. By making this amendment, the diameter of the stud must be equal to the required diameter for the hanger rod. The diameter of the threaded fitting of the powder-driven studs shall meet the hanger rod diameter requirements of Table 9.1.2.1.

9.2.1.3.3.5

9.2.1.3.3.5 Where flexible sprinkler hose fittings are supported by a ceiling that does not meet design and installation criteria set forth in 9.2.1.3.3.2, such fitting shall be provided with hangers in accordance with 9.2.3.5, unless the flexible hose fitting is provided with a hanger assembly specifically approved by a Nationally Recognized Testing Laboratory for both the flexible sprinkler hose fitting and the specific method of installation.

Justification: Section 9.2.1.3.3.2 provides guidance for what to do when flexible sprinkler hose is supported by grid ceilings, but does not discuss what to do when flexible sprinkler hose is supported by another type of ceiling, such as gyp board. When this is the case, the intent of the amendment is to treat the flexible sprinkler hose

similar to unsupported armovers in accordance with Section 9.2.3.5. However, if there is an approved hanger assembly for flexible sprinkler hose that describes a hanger assembly in the manner in which it is proposed to be hung, then that hanger assembly would be permitted.

9.3.5.9.3.1

9.3.5.9.3.1 The value of S_s used in Table 9.3.5.9.3 shall be 0.95 ~~obtained from the authority having jurisdiction~~ or derived from seismic hazard maps.

Justification: The seismic parameters in NFPA 13 have been modified to be more inline with the ICC seismic requirements for mechanical systems. The value of S_s varies greatly across the valley, in general terms, highest in Boulder City, and decreasing as you move north. The modification to specifically state the value of S_s will make all areas the same, and reduce the number of inquiries "obtained from the authority having jurisdiction". The value of $S_s = 0.95$ corresponds to the current value $C_p = 0.50$.

9.3.6.7

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

Justification: This amendment adds seismic restraint requirements for longer drops and armovers. The intent is to limit damage during a seismic event.

10.1.5

10.1.5 Working Pressure. Piping, fittings, and other system components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 150 psi (10 bar). When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 200), or 50 psi greater than the FDC design pressure, whichever is greater.

Justification: This amendment is existing in part. This amendment intends to require higher pressure ratings for underground lines that can be fed by Fire Department Connections. Delivery of water at Fire Department Connections can cause pressures that exceed 150 psi. Typically, use of 200 psi rated line can withstand the pressures delivered at the FDC. However, when higher pressures are required at the FDC due to system demands, the underground line is required to be listed for 50 psi above that demand pressure. The 50 psi above design pressure is to allow for pipe to be listed for the pressure used during the hydrostatic test

11.2.3.1.4(4)

11.2.3.1.4 (4) The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft² (279 m²):

11.2.3.1.4(4)(a) Noncombustible ~~and limited-combustible~~ concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

11.2.3.1.4(4)(b) Noncombustible ~~and limited-combustible~~ concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

11.2.3.1.4(4)(c) (*No Change*)

11.2.3.1.4(4)(d) Light or ordinary hazard occupancies where noncombustible ~~or limited-combustible~~ ceilings are directly attached to the bottom of solid wood joists or solid ~~limited-combustible construction or~~ noncombustible construction so as to create enclosed joist spaces 160 ft³ (4.8 m³) or less in volume, including space below insulation that is laid directly on top or within the ceiling joist in an otherwise sprinklered concealed space.

11.2.3.1.4(4)(e) ~~Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed in the space~~.

11.2.3.1.4(4)(f) ~~Concealed spaces in which the exposed materials are constructed entirely of fire-retardant treated wood as defined by NFPA 703, *Standard for Fire Retardant Treated Wood and Fire Retardant Coatings for Building Materials*.~~

11.2.3.1.4(4)(g) (*No Change*)

11.2.3.1.4(4)(h) (*No Change*)

11.2.3.1.4(4)(i) (*No Change*)

11.2.3.1.4(4)(j) Light or ordinary hazard occupancies where non-combustible ~~or limited-combustible~~ ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25.4 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft³ (4.5 m³) using materials equivalent to ½ in. (12.7 mm) gypsum board and at least 3 ½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

Justification: This amendment is intended to remove the term “limited-combustible”. The committee feels that allowing unprotected combustibles in concealed space is not warranted, and therefore wanted to maintain the existing amendment. Further, the committee continues the deletion of allowing materials with a flame spread of 25 and fire-retardant wood in concealed spaces without sprinkler protection.

11.3.1.1

11.3.1.1 The design area shall be ~~the area that includes the four adjacent sprinklers that produce the greatest hydraulic demand~~ in accordance with either 11.2.3.2 or 11.2.3.3.

Justification: This amendment is intended to provide consistency for regional application of codes. The intent of the amendment is to require that hydraulic calculations for residential occupancies be either by area/density method or by room design method. This amendment eliminates the use of the 4-head calculation in NFPA 13. The purpose of the amendment is to require greater sprinkler system flow to be provided to fire areas in residential units than required by the base code. There is concern that the fires within commercial residential occupancies have significant fire loads, and the fires in residential occupancies are more dangerous than other commercial occupancies due to the nature of occupants, which are considered to be asleep or otherwise less alert than other commercial applications. As such, allowing a lesser system in residential occupancies is not appropriate for this jurisdiction.

11.3.1.3

11.3.1.3 Unless the requirements of 11.3.1.4 are met, the minimum required discharge from each ~~of the four most demanding sprinklers~~ sprinkler shall be the greater of the following:

(1) In accordance with the minimum flow rates indicated in the individual listings

(2) Calculated based on delivering a minimum of 0.1 gpm/ft^2 (4.1 mm/min) over the design area in accordance with the provisions of 8.5.2.1 or 8.6.2.1.2.

Justification: This amendment is intended to provide consistency for regional application of codes. The intent of the amendment is to eliminate the use of the four head calculation method for residential occupancies. This is a companion proposal to the proposal made for Section 11.3.1.1. This amendment is required to coordinate with that amendment for Section 11.3.1.1, should that amendment be approved.

11.3.3.1

11.3.3.1 Sprinklers in a water curtain such as described in 8.15.4 ~~or~~ , 8.15.17.2 or 8.15.23 shall be hydraulically designed to provide a discharge of 3 gpm per lineal foot (37L/min per lineal meter) of water curtain, with no sprinklers discharging less than 15 gpm (56.8 L/min) or per the listing requirements of the specific head being used.

Justification: The purpose of this amendment is to ensure that sprinklers used as alternates for passive protection are listed for the purpose. This is a companion to the amendment for Section 8.15.23.

11.3.3.3

11.3.3.3 ~~If a single fire can be expected to operate sprinklers within the water curtain and within the design area of a hydraulically calculated system,t~~The water supply to the water curtain shall be added to the water demand of the hydraulic calculations and be balanced to the calculated area demand.

Justification: The purpose of this amendment is to remove the ambiguity from the code section. This change forces all designers to hydraulically calculate the sprinkler system using both the water curtain and the remote area, thus providing a conservative design.

11.3.5

11.3.5 NONSTORAGE OCCUPANCIES WITH HIGH CEILINGS

11.3.5.1 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.

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

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

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

Justification: NFPA 13 has significant data for sprinkler protection of storage commodities in high-ceiling areas, but does not provide additional guidance for sprinkler protection in non-storage high-ceiling areas.

Tests after the McCormick Place Fire show the need for increased remote areas for tall ceilings. That is the basis for the increases in remote area for the light and ordinary occupancies shown in proposed section 11.3.5.1.

In all, the dynamics of fire in tall spaces call for increased water droplet size. In tall spaces, the forces of fire plumes are greater, and the water droplet has farther to travel in order to reach the fire. In order to have the water droplet be able to penetrate the plume intact and reach the fire, larger droplets are necessary. This is the basis for the larger k-factor and the limit on sprinkler pressure in proposed sections 11.3.5.1 and 11.3.5.2.

Delays in sprinkler activation due to loss of heat in the fire plume necessitate the higher remote areas. These remote area increases are shown in proposed section 11.3.5.1. After a height of 50 feet, there is concern that activation of sprinklers may take longer than is feasible for responsible fire protection. For that reason, analysis is required for spaces with ceiling heights over 50 feet in proposed section 11.3.5.2.

Finally, there is a requirement for analysis for extra hazard occupancies with ceiling heights exceeding 25 feet. It is recognized that the same inherent hazards of tall ceilings are present in extra hazard occupancies. However, there is little available test data providing guidance on protection for extra hazard occupancies with tall ceilings. As such, all extra hazard occupancies with ceilings over 25 feet require additional analysis prior to approvals.

11.3.6

11.3.6 SPRINKLER PROTECTION FOR EXHIBITION SPACES AND STAGES WITH FLY GALLERIES

11.3.6.1 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.

11.3.6.2 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.

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

Justification: Portions of this proposal are derived from FM data sheets on non-storage areas with high floor to ceiling clearance. The intent of the amendment is to address fire sprinkler requirements for high-ceiling spaces for exhibition spaces and for stages with fly loft areas. NFPA 13 has significant data for sprinkler protection of storage commodities in high-ceiling areas, but does not provide additional guidance for sprinkler protection in non-storage high-ceiling areas.

During development of the Boston Convention Center, FM Global did several tests to determine sprinkler effectiveness. FM Global performed tests under a 60 foot ceiling of typical exhibit spaces. The results of the test led to criteria from FM, requiring a minimum density of 0.45 gpm/ft^2, a design area of 5,000 square feet, extra-large orifice heads (k=11.0), quick response sprinklers, a hose stream demand of 500 gpm, and a maximum sprinkler pressure of 30 psi. Later these criteria have been incorporated into FM Data Sheet 3-26, which is currently published. The criteria being presented in this amendment follow directly from the criteria for non-storage occupancies, heavy loading. In addition, the 30 psi limit for each head is added to ensure large droplet sizes.

In all, the dynamics of fire in tall spaces call for increased water droplet size. In tall spaces, the forces of fire plumes are greater, and the water droplet has farther to travel in order to reach the fire. In order to have the water droplet be able to penetrate the plume intact and reach the fire, larger droplets are necessary. This is the basis for the larger k-factor and the limit on sprinkler head pressure.

This amendment is being presented solely for exhibition spaces and for stages with fly galleries. Exhibition spaces are considered to be spaces where large exhibits, such as manufactured housing, boats, vehicles, multi-story exhibit booths, and other similar large displays are possible. In general, the space would have to allow for vehicles to drive into. Meeting rooms that do not have roll-up doors are not considered exhibition spaces. Current spaces that would be considered exhibition spaces would be the Las Vegas Convention Center, the Sands Expo, the Mandalay Bay convention center, and the MGM Grand Convention Center, to name a few. The lack of controls over what is allowed on the floors, and the fact that the spaces are constructed to handle large displays, lead to the need for this amendment.

In similar fashion, stages that are equipped with fly lofts is also being proposed for this amendment. Fly lofts are considered elevated walking areas that can support stage equipment and storage of props for "flying" into the stage box. Typically these are on grid floors. Stage props are not typically reviewed for flammability, and the amount of props on stage is not limited. Further, with fly galleries, there is the ability to deliver large props to the stage, and often there will be multiple back drops that can obstruct sprinkler coverage. Due to the number and types of props that can occur on large stages, and the back drops that obstruct sprinklers, this amendment is necessary.

12.9.2

12.9.2 The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft^2 (279 m^2):

12.9.2(1) Noncombustible ~~and limited-combustible~~ concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

12.9.2(2) Noncombustible ~~and limited-combustible~~ concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

12.9.2(3) (*No Change*)

12.9.2(4) Light or ordinary hazard occupancies where noncombustible ~~or limited-combustible~~ ceilings are directly attached to the bottom of solid wood joists so as to create enclosed joist spaces 160 ft^3 (4.8 m3) or less in volume, including space below insulation that is laid directly on top or within the ceiling joist in an otherwise sprinklered concealed space.

12.9.2(5) ~~Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire when tested in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, extended for an additional 20 minutes in the form in which they are installed in the space~~.

12.9.2(6) ~~Concealed spaces in which the exposed materials are constructed entirely of fire-retardant treated wood as defined by NFPA 703, *Standard for Fire Retardant Treated Wood and Fire Retardant Coatings for Building Materials.*~~

12.9.2(7) (*No Change*)

12.9.2(8) (*No Change*)

12.9.2(9) (*No Change*)

12.9.2(10) Light or ordinary hazard occupancies where non-combustible ~~or limited-combustible~~ ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25.4 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft^3 (4.5 m^3) using materials equivalent to ½ in. (12.7 mm) gypsum board and at least 3 ½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

Justification: This amendment is intended to provide consistency for regional application of codes. to remove the term "limited-combustible". The committee feels that allowing unprotected combustibles in concealed space is not warranted, and therefore wanted to maintain the existing amendment. Further, the committee continues the deletion of allowing materials with a flame spread of 25 and fire-retardant wood in concealed spaces without sprinkler protection.

22.15.2.2.1.3.1

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

Justification: This amendment requires chute sprinklers be fed off of separate dedicated sprinkler supply risers. The chute is a separate compartment within buildings that transverses multiple floor levels. If a chute fire is to occur, it is expected that more than one chute sprinkler may activate. If the chute sprinklers are fed off of the floor system, responding fire service would have indication of a fire that has penetrated multiple floors, as evidenced from activation of water flow switches on separate floor levels. By restricting the chute sprinkler supply to a separate riser, activation of multiple floor level systems is eliminated, and the response time to the true fire location is decreased by providing correct information to responding fire service

22.38

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

22.38.1 General. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, for a IBC Group R Division 3 Occupancy and buildings built under the IRC, the design requirements in Table 22.38.1 shall be applied.

Table 22.38.1 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC[4]

Building Area Size Range [6]	PROTECTION RESIDENTIAL System Type[1,3]	Separate Sprinkler Lead-in Required [5]	Minimum Underground Pipe Size [5]	Minimum Water Meter Size[7]	Sprinklers Required In Areas Subject To Freezing.
<3,600 sq ft	Standard NFPA 13D [2]	See NFPA 13D for design requirements.			

≥3,600 sq ft & <10,000 sq ft	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements			
≥10,000 sq ft & <15,000 sq ft	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
≥ 15,000 sq ft	Modified NFPA 13 [1]	Yes	N/A	N/A	Yes

N/A = Not Applicable

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

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

1. **Fire Department Connections (FDC):** A 2½-inch fire department connection is required. A single snoot connection will be accepted. The FDC shall be located on the garage wall facing the street except for special circumstances where the FDC may be freestanding and located adjacent to the street or private drive. A freestanding FDC in these circumstances may be designed into the mailbox column.
2. **Riser Room:** Risers shall be located in either the garage or within a dedicated room with an exterior door. Provided the garage/room is fully insulated the requirement for maintaining 40°F will not require a source of heat.
3. **Inspectors Test Connection:** The inspectors test location may be piped off the system riser.
4. **Piping in locations less than 40°F:** Dry pipe systems are not permitted for the protection of living spaces, anti-freeze systems shall be used. The protection of non-living spaces such as attics may be protected by dry-pipe systems.
5. **Anti-Freeze Loops:** The capacity shall not exceed 80 gallons.
6. **Separate Water Supply:** A separate water lead-in for the fire sprinkler system along with an approved (by the local water authority) back-flow prevention device is required. The back-flow prevention device shall be located at the street with in an approved insulated enclosure. The lead-in shall be sized using the minimum pipe size available that provides the calculated flow.
7. **Control Valves:** All valves used to control the sprinkler system are required to be indicating. A Post Indicator Valve (PIV) is not permitted.
8. **Electrical Supervision:** When required by the *fire code official*, the main control valves shall be electrically supervised. The back-flow valves are not required to be electrically supervised.
9. **Fire Pumps:** Electric fire pumps normally accepted in NFPA –13D systems for residential use (UL listed jockey pump) are acceptable.
10. **Notification Devices:** Interior – One (1) interior horn/strobe shall be installed in a location specified by the homeowner. Exterior – One (1) exterior horn/strobe shall be located above the FDC or other acceptable location. The sprinkler flow switch shall activate both of the required devices.

11. **Residential Sprinkler Heads:** Residential sprinkler heads shall be utilized and the design allowances specified in section 11.2.3.2.3.1 (reduction to design area) may be applied.
12. **Hangers and Earthquake Bracing:** The hanging of sprinkler pipe shall be in accordance Chapter 9. Earthquake bracing is not required.
13. **Garages:** Garages shall be classified as Ordinary Hazard Group I. Commercial style QR sprinkler heads are required.
14. **Location of Sprinklers:** Sprinklers shall be installed in all areas except where omissions are permitted as follows:

    a. Inaccessible attic spaces.

    b. Exterior overhangs, porches, and carports.

    c. Rooms not provided with environmental control.

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

Justification: This amendment is intended to provide consistency for regional application of codes.. The purpose of the amendment is to provide design criteria for single family homes that are required to be protected in accordance with the protection requirements of NFPA 13D.

23.1.3

23.1.3 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 and occupant
(2) Location, including street address
(3) Point of compass
(4) Full height cross section, or schematic diagram, including structural member information is required for clarify and including ceiling construction and method of protection for nonmetallic piping
(5) Ceiling/roof heights and slopes not shown in the full height cross section
(6) Location of partitions
(7) Location of fire walls
(8) Occupancy class, label and name of ~~each~~ all areas or rooms
(9) Location and size of concealed spaces, closets, attics, and bathrooms
(10) Any small enclosures in which no sprinklers are to be installed
(11) Size of city main in street and whether dead end or circulating; if dead end, direction and distance to nearest circulating main; and city main test results and system elevation relative to test hydrant
(12) Other sources of water supply, with pressure and elevation
(13) Make, type, model, and nominal K–factor of sprinklers including sprinkler identification number
(14) Temperature rating and location of high-temperature sprinklers
(15) Total area protected by each system on each floor
(16) Number of sprinklers on each riser per floor
(17) Total number of sprinklers on each dry pipe system, preaction system, combined dry pipe-preaction system, or deluge system
(18) Approximate capacity in gallons of each dry pipe system
(19) Pipe type and schedule of wall thickness
(20) Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line
(21) Location and size of riser nipples

(22)Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawing any sections to be shop welded and the type of fittings or formations to be used
(23)Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable
(24)All control valves, check valves, drain pipes, and test connections
(25)Make, type, model, and size of alarm or dry pipe valve
(26)Make, type, model, and size of preaction or deluge valve
(27)Kind and location of alarm bells
(28)Size and location of standpipe risers, hose outlets, hand hose, monitor nozzles, and related equipment
(29)Private fire service main sizes, lengths, locations, weights, materials, point of connection meters, and valve pits; and the depth that the top of the pipe is laid below grade
(30)Piping provisions for flushing
(31)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
(32)For hydraulically designed systems, the information on the hydraulic data nameplate
(33)A graphic representation of the scale used on all plans
(34)Name, ~~and~~ address, phone number, and contractor's license number of sprinkler contractor
(35)Nevada State Fire Marshal registration number
(36)Signature and NICET number, or engineer's seal, of the designer
(37)General notes as required by the AHJ
(38)Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets
(39)The minimum rate of water application (density or flow or discharge pressure), the design area of water application, in-rack sprinkler demand, and the water required for hose streams both inside and outside
(40)The total quantity of water and the pressure required noted at a common reference point for each system
(41)Relative elevations of sprinklers, junction points, and supply or reference points
(42)If room design method is used, all unprotected wall openings throughout the floor protected
(43)Calculation of loads for sizing and details of sway bracing
(44)The setting for pressure-reducing valves
(45)Information about backflow preventers (manufacturers, size, type)
(46)Information about antifreeze solution used (type and amount)
(47)Size and location of hydrants, showing size and number of outlets and if outlets are to be equipped with independent gate valves. Whether hose houses and equipment are to be provided, and by whom, shall be indicated. Static and residual hydrants that were used in the flow tests shall be shown
(48)Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system
(49)Size, location, and piping arrangement of fire department connections
(50)Ceiling/roof heights and slopes not shown in the full height cross section
(51)Edition year of NFPA 13 that the sprinkler system is designed to.

Justification: The purpose of this amendment is to provide guidance to designers as to the necessary information required for working plans.

23.2.1

23.2.1 Water Supply Capacity Information. The following information shall be included:

(1) Location and elevation of static and residual test gauge with relation to the riser reference point
(2) Flow location
(3) Static pressure, psi (bar)
(4) Residual pressure, psi (bar)
(5) Flow, gpm (L/min)

(6) Date
(7) Time
(8) ~~Test conducted by or information supplied by~~. Flow tests shall be witnessed by the Authority Having Jurisdiction
(9) Other sources of water supply, with pressure or elevation

Justification: The purpose of this amendment is to clarify that flow tests are to be witnessed by the AHJ.

23.4.1.6

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

Justification: The purpose of this amendment is to limit the velocity in calculations, due to issues with accuracies in the calculations. As such, there is a need for this limit.

23.4.1.7

23.4.1.7 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.

Justification: This amendment is intended to provide consistency for regional application of codes. This is a companion amendment to proposed Section 23.4.1.6. The city supplies available in this valley fluctuate through the day, with the range in pressure movement exceeding several psi. In addition, as discussed in the justification for proposed Section 23.4.1.6, the use of Hazen-Williams equations bring with it an uncertainty in determining the true friction loss. The use of a safety factor will aid to overcome these deficiencies. In addition this is a State Fire Marshal regulation

25.2.3.2.2

25.2.3.2.2 The test shall measure the time to trip the valve and the time for water to be discharged from the inspector's test connection. The flow from the inspector's test shall be predominantly continuously flowing water with small amounts of air permitted. All times shall be measured from the time the inspector's test connection is completely opened.

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to define the point when timing is to be ceased when testing the trip time for a dry valve. During testing of dry systems, there are often spurious spurts of water that are delivered prior to achieving continuous water flow. These are not viewed as water delivery, and the spurious water should not be used to stop timing. After continuous water delivery is achieved, there may still be small amounts of air due to discharge of small air pockets. The amendment therefore is written to allow for small amounts of air.

25.2.3.2.2.1

25.2.3.2.2.1 Dry systems calculated for water delivery in accordance with 7.2.3.6 shall be required to prove the ~~exempt from any~~ specific water delivery time requirement set forth in 7.2.3.5 and 7.2.3.7.

Justification: This amendment addresses the testing requirements for dry systems designed for water delivery through calculation. This amendment follows amendments made to 7.2.3 requiring dry systems designed by calculation to be proven by a physical flow test.

25.5.1

25.5.1 The installing contractor shall identify a hydraulically designed sprinkler system with a machine-engraved ~~permanently marked~~ weatherproof metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font secured to the riser it serves with corrosion-resistant wire, chain, or other ~~approved~~ means approved by the AHJ. Such signs shall be placed at the alarm valve, dry pipe valve, preaction valve, or deluge valve supplying the corresponding hydraulically designed area. Signs located at the system control riser shall be allowed to be combined with the General Information Sign described in 25.6.

Justification: This is not only required, but extremely important information for field inspection personnel to have while conducting inspections. This is in a sense the birth certificate of the sprinkler system and gives the Inspector immediate knowledge of what the sprinkler system is capable of producing. Rather than do research after the fact and leave a hazard for any period of time, an Inspector will have a very good general idea of how high storage can be within a building as well as what type(s) of commodities can be properly protected and to what height. It is essential that this permanent record be just that and remain permanently on the property and always be legible.

For years, these plates have been installed as a sticker using permanent marker or a metal plate using a scribing tool. The areas where these signs are hung are generally dusty and/or exposed to the extreme heat of the Las Vegas Valley. Our findings have shown that permanent marker is good for less than five (5) years when these are regularly exposed to these conditions. Two other problems are consistently noted with these plates being installed with permanent marker or a scribing tool. The first deals with those written in permanent marker. Not everyone prints well and the information required often cannot be written small and legibly enough with a permanent marker or a scribing tool to make the information permanently readable. The same applies to the scribing tools as well as the fact that most scribing tools etch very thin lines that again are not readable. People often make mistakes with these also which leads to other issues with their readability.

25.6.1

25.6.1 The installing contractor shall provide a general information sign used to determine system design basis and information relevant to the inspection, testing, and maintenance requirements required by NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.

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

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

Justification: This is a companion to the amendment for 25.5. The purpose of this amendment is to make the sign permanent to facilitate use in future years. In addition, this amendment allows for the two signs to be combined, where applicable.

NFPA 13D

1.1.1

1.1.1 This standard shall cover the design and installation of automatic sprinkler systems for protection against the fire hazards in one- and two-family dwellings and manufactured homes.

When sprinkler protection is being provided to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the minimum design criteria shall be as outlined in Section 8.4 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC.

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to indicate that the scope of NFPA 13D may be used to address fire code issues, such as fire flow, number of fire hydrants, and fire access, but only when the system is designed in accordance with Section 8.4. A companion amendment for a new Section 8.4 is proposed.

The fire code provides deviations in code requirements for fire flow, fire hydrants, and fire access, when the building in question is "protected throughout" with fire sprinklers. The focus of both NFPA 13D and NFPA 13R are for life safety, and not for property protection. These designs allow for a multitude of unsprinklered areas. Therefore, the use of the base codes of NFPA 13D and 13R appear to be inappropriate when modifying fire flow, fire hydrant, fire access requirements.

The protection matrix calls for increases in sprinkler protection over the base NFPA 13D and NFPA 13R base documents. With these increases, the use of amended NFPA 13D and NFPA 13R are deemed acceptable to allow trade-offs in the fire code

3.3.11.4

3.3.11.4 ***Network Sprinkler System.*** A type of multipurpose system utilizing a common piping system supplying all domestic fixtures and fire sprinklers ~~where each sprinkler is supplied by a minimum of three separate paths~~.

Justification: The definition is modified to correlate with the amendments to Section 6.3, 6.3.1, and 6.3.2

4.5

4.5 Working Plans ~~Documentation~~

~~Documentation shall be available on request to ensure adequate water supply, listed devices, and adequate sprinkler coverage have been addressed.~~

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

1. Name of owner.
2. Location, including street address.
3. Point of compass.
4. Full height cross section.
5. Ceiling/roof heights and slopes not shown in the full height cross section.
6. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
7. Name and label for each area or room.

8. For systems supplied by city mains, location and size of city main in street, and location, size, and type of domestic line, including length to city connection, and water meter location and size. Static and residual hydrants that were used in flow tests shall be shown. The location of the 5 gpm domestic demand shall be indicated.
9. Make, type, model, temperature rating, nominal K-factor, and number of each type of sprinkler, including sprinkler identification number.
10. Pipe type and schedule of wall thickness.
11. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
12. Location and size of riser nipples and drops.
13. Type of fittings and joints.
14. Type and locations of hangers, and methods of securing sprinklers when applicable.
15. Location and size of all valves and drain pipes.
16. Location and size of water gauges.
17. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
18. A summary of the hydraulics, including the static pressure, residual pressure, and flow of the water supply, the pressure and flow demands at the point of connection to the water supply, and the pressure and flow demands at the bottom of the system riser.
19. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
20. Relative elevations of sprinklers, junction points, and supply or reference points.
21. A graphic representation of the scale used on all plans.
22. Name, address, phone number, and contractor's license number of contractor.
23. Nevada State Fire Marshal registration number.
24. Signature and NICET number, or engineer's seal, of the designer.
25. Indicate by note the minimum rate of water application per sprinkler head, the maximum spacing for each head, and the domestic demand.
26. Information about antifreeze solution used. Indicate the type of antifreeze used, the amount of antifreeze in the system, and information about antifreeze compatibility with the pipe.
27. General notes as required by the AHJ.
28. Edition year of NFPA 13D to which the sprinkler system is designed.
29. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

Justification: There is little difference in the basic details of information expected to be shown on sprinkler plans submitted to the AHJ, regardless of whether the system is 13D, 13R, or 13 design. However, these three codes have drastically different lists of required information. The intent of this amendment is to update the list of items required on plans so that submittals for 13-D systems are similar to submittals for 13 systems

6.2.3.1

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

Justification: This change requires that sprinkler systems be controlled with the same valve as the domestic supply. This will prevent homeowners from shutting down their sprinkler system and keep the system in disrepair.

6.3.1

6.3.1 A multipurpose piping system shall be installed in accordance with 6.3.~~2~~ through 6.6.~~5.3~~

Justification: In order to accommodate changes for the various multipurpose systems, an additional section 6.6 is added. This change is needed to reference the correct sections

6.3.1.1

6.3.1.1 All one and two-family dwellings sprinkler systems supplied by the water purveyor shall be multi-purpose, in accordance with this section. This requirement applies both to systems fed with a single-outlet water meter and to systems fed with a dual-outlet water meter, which may be required by the water purveyor.

Justification: Sets the requirements that all 13D systems must be multi-purpose.

6.5

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

6.5.1 ~~Where common supply pipes serve both fire sprinkler and domestic use, they shall comply with 6.5.2 and 6.5.3.~~ An accessible check valve shall be installed on the fire sprinkler riser to maintain system pressure.

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

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

~~6.5.3 Where water treatment and filtration are installed, one of the following conditions shall be met:~~

~~a. The flow restriction and pressure loss through the water treatment equipment shall be taken into account in the hydraulic calculations.~~
~~b. An automatic bypass shall be installed around the water treatment equipment that directs all water directly to the system.~~

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

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

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

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

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

Justification: The title of the section is changed to "Passive Purge Multipurpose Systems" and language regarding the applicability of that system is added.

Section 6.5.1 is amended to insert a requirement for a check valve. The check valve is required for these "separate" systems to maintain pressure in the fire sprinkler lines.

The change to 6.5.3 is to address the single-outlet meter that is commonly used in current designs. The design allows a valve on the meter to shut off both domestic and fire sprinkler supplies. The domestic system will serve all fixtures except the master bathroom toilet. The deletion is because this warning sign is not applicable to the "separate" systems, as any such devices discussed in the base code would be added downstream of the fire sprinkler supply, and therefore would not affect the fire sprinkler design.

The change to 6.5.4 is intended to require separate underground supplies after the meter, with a valve on the domestic side. The purpose of this is to allow for a water purveyor to shut off the domestic feed (for repair or non-payment), while still allowing the fire sprinkler system to operate, with minimal cold water domestic fixtures still supplied. The section refers to a UDACS plate that will show the design of the water meter. The deletion is because these devices would be installed downstream of the fire sprinkler riser, and therefore would not affect the fire sprinkler system design.

The addition of 6.5.5 is to indicate that no backflow preventers, water treatment devices, or pressure reducing valves are allowed on the fire sprinkler system. The use of backflow preventers is prohibited to ensure avoid pressure losses that occur with backflow preventers. The deletion of the water treatment device is to make sure that the sprinkler water is not inhibited in delivery of water supply. The water treatment device, if desired, can still be added after the sprinkler system and prior to the toilet. The deletion of the pressure reducing valve prior to the sprinkler system is to allow for all of the available pressure to go to the sprinkler systems. A pressure reducing valve may still be required prior to the domestic fixtures.

The addition of 6.5.6 is to require that system piping be looped, with maximum dead-end lengths of 50 feet. The purpose of this is to ensure that the water throughout the system is being circulated, to avoid designs where the connection between the sprinkler system and the domestic fixtures is not designed to circulate all sections of pipe. Multiple 50 feet lengths of dead-end pipe are permitted to allow piping over and down to specific head locations.

The addition of 6.5.7 is to require that the connection between the sprinkler system and the domestic supply by way of connection to the toilet in the master bathroom. The method in which this connection is made is not discussed here, and is left to the plumbing codes.

The addition of 6.5.8 is intended to provide consistency for regional application of codes. The code does not discuss pressure gauges for wet systems. Having a gauge on the system side of the check valve allows for verification that sufficient pressure is available for system operation

6.6

6.6 Network Multipurpose Systems. Network multipurpose systems shall provide supply for all interior domestic fixtures and fire sprinkler needs. This design may be used with a single-outlet meter, but is prohibited from use

with a dual-outlet meter, which may be required by the water purveyor. Such systems shall be considered acceptable by this standard where designed in accordance with 6.6.1 through 6.6.8

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

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

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

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

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

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

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

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

1. The flow restriction and pressure loss through the water treatment equipment shall be 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.

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

Justification: A new section 6.6 is introduced, entitled “Network Multipurpose Systems”. With the title is discussion about applicability of this system. Note that the system is not permitted where the water purveyor requires a dual-outlet meter, since the dual-outlet meter is used to allow for shutting off domestic supply while maintaining fire sprinkler system supply, which can not be accomplished with networked systems.

Section 6.6.1 is a reprint of base code. The intent of the amendment is to require that a 5 gpm domestic demand be added when the system is shared by two or more dwellings.

Section 6.6.2 is to address the single-outlet meter that is commonly used in current designs. The design allows a valve on the meter to shut off both domestic and fire sprinkler supplies. The domestic system will serve all fixtures and all fire sprinklers.

Section 6.6.3 clarifies that if a dual-outlet meter is required by the water purveyor, then a network system is not permitted, since network systems by definition combine all of the domestic fixtures with the fire sprinkler system.

Section 6.6.4 clarifies how network systems must be piped.

Section 6.6.5 requires a full flow test to be performed on network systems, as these systems are quite difficult to inspect in the field. The full flow test assures the fire code official that the system is correctly designed.

Section 6.6.6 is relating to warning signs discussing the addition of water filtration devices.

Section 6.6.7 is a reprint of the base code relating to how water filtration devices are to be installed.

Section 6.6.8 is intended to provide consistency for regional application of codes. The code does not discuss pressure gauges for wet systems. Having a gauge on the system side of the check valve allows for verification that sufficient pressure is available for system operation.

7.1.1

7.1.1 A single control valve arranged to shut off both the domestic system and the sprinkler system shall be installed ~~unless a separate shutoff valve for the sprinkler system is installed in accordance with 7.1.2~~.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to eliminate an option to have the sprinkler system on a separate control valve than the domestic water system. Having a separate valve for the sprinkler system could lead to a situation where the sprinkler control valve is left closed. Requiring a single control valve for both the domestic and sprinkler supply is seen as being more reliable, as there is less fear that the sprinkler control valve will be shut, due to the need to maintain flow through domestic fixtures

7.1.2

7.1.2 The sprinkler system piping shall not have a separate control valve installed. ~~unless supervised by one of the following methods:~~

~~(1) Central station, proprietary, or remote station alarm service~~
~~(2) Local alarm service that causes the sounding of an audible signal at a constantly attended location~~
(3) ~~Valves that are locked open~~

Justification: The purpose of this amendment is to eliminate an option to have the sprinkler system on a separate control valve than the domestic water system. Having a separate valve for the sprinkler system could lead to a situation where the sprinkler control valve is left closed. Requiring a single control valve for both the domestic and sprinkler supply is seen as being more reliable, as there is less fear that the sprinkler control valve will be shut, due

to the need to maintain flow through domestic fixtures. This is a companion amendment to a proposal for Section 7.1.1

7.7

7.7 ~~Attics.~~ Unconditioned Spaces

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

Justification: The IECC (energy code) requires water piping installed in unconditioned spaces to be insulated to a minimum R-2 level. Fiberglass insulation with a depth of 1 inch would provide more than R-2 insulation. Commonly available tube insulation also provides R-2 insulation. The committee feels that this provision should apply to all unconditioned spaces where pipe passes through, not just attics

8.1.3.1.2

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.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require that an approved report be provided prior to installing fire sprinklers outside of their listing. The base code allows for the installation of fire sprinklers outside of their listing, but does not provide guidance on the limitations of this provision. Requiring the report will provide guidance on acceptable methods of installation, even if outside of the listing of the fire sprinkler

8.3.4.1

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

Justification: A fire in a garage without fire sprinklers with habitable rooms above it can undermine the structural integrity of the habitable rooms above and increase the risk of occupants within those rooms not being able to exit the structure safely.

8.4

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

8.4.1 General. When a sprinkler system is being installed 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 shall be applied.

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

Building Area SIZE RANGE [6]	Mitigation Residential SYSTEM TYPE[1,3]	SEPARATE SPRINKLER LEAD-IN REQUIRED [5]	MINIMUM UNDERGROUND PIPE SIZE [5]	MINIMUM WATER METER SIZE[7]	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
< 3,600 sq.ft.	Standard NFPA 13D [2]	No	1"	¾"	No
≥ 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	No	1"	¾"	No
≥ 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
≥15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements			

N/A = Not Applicable

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

8.4.2.1 Where required. When Table 8.4 requires an Enhanced 13D design, sprinklers shall be installed throughout the structure except where omissions are permitted by section 8.3, and 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

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

Justification: The purpose of this amendment is to provide for minimum protection features for residential homes to still allow application of trade-offs provided for in the Fire Code. For instance, the Fire Code allows reduction in required fire flow for structures when they are fire sprinklered. However, the intent of the typical 13D system for residential is for life-safety purposes only. While the system can provide some property protection, the value of that protection decreases as the home size becomes larger. While there is some comfort in allowing the trade-offs in small homes that are protected solely with the basic NFPA 13D system, this comfort level decreases with larger homes. As such, the protection matrix requires additional protection for larger homes. In particular, homes that are larger than 5,000 square feet but less than10,000 square feet require protection in accordance with enhanced NFPA 13D. Homes less than 5,000 square feet are deemed small enough to not require additional protection higher than what is provided by the base NFPA 13D system

10.1.1.1

10.1.1.1* The system shall provide at least the flow required to produce a minimum discharge density of 0.05 gpm/ft^2 (2.04 mm/min) or the sprinkler listing, whichever is greater, to the design sprinklers <u>including fire sprinklers required in garages per section 8.3.4.1.</u>

Justification: Separate from the mitigation/protection matrix, it is proposed that the garages to be protected at the same density as the rest of the house.

Per appendix A.8.6.4 although NFPA 13D does not require garages to be sprinklered, some authorities having jurisdiction take it upon themselves to add this requirement locally. In such circumstances, residential or quick-response sprinklers with a two sprinkler design in the garage with the same piping used in the rest of the dwelling may be used. It is recognized that residential sprinklers have not been tested specifically for fires in garages, but field experience has shown that the sprinklers help to alert occupants to the fact that there is a fire, can reduce the possibility of flashover, and can improve the chances for occupants to escape. The 0.05 gpm/ft^2 density is also allowed by Section 6.8.3 of NFPA 13R

Also at a 0.15 protection density as proposed in the mitigation matrix, there are limitations that are put forth on the single family system. With ¾" water meters, fire sprinklers in the garage at a 0.15 density must be spaced at maximum of 83 s.f. utilizing 4.2K factor heads. This adds costs to the fire sprinkler system and makes the use of ¾" water meters very difficult.

Lastly, per section 7.5.3 and 7.5.4, commercial QR fire sprinkler heads are only allowed as dry heads and in mechanical closets.

As long as the occupants can exit the structure, then the system has done its job. Especially when we are requiring fire sprinkler in an area that otherwise would have none.

12.1

12.1 The installer shall provide to the owner/occupant instructions on inspecting, testing, and maintaining the system. <u>The instructions shall be attached to the riser or the inside of the panel access door. The instructions shall be weatherproof.</u>

Justification: With tract homes the owner at the final is not the long term owner or even who the next owners may be over the life of the house. By mounting the information at the riser (inside the door cover) the information will stay with the system. The intent of calling for weatherproof information is to require that a laminated sheet or a weatherproof sticker be provided, either inside the panel door, or directly on the riser

NFPA 13R

1.1

1.1 Scope

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

When sprinkler protection is being provided to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access for single-family residential occupancies, the minimum design criteria shall be as outlined in Section 7.6 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC.

Justification: There are two intents with this amendment. The first is to change the scope of NFPA 13R to cover only residential occupancies that are one or two stories in height. Residential occupancies that are three of more stories in height are then required to be under the scope of NFPA 13. This amendment is similar to a code provision that is in the State Fire Marshal regulations.

The second intent is to indicate that 13R can be used for the protection matrix that is located in Section 7.6. The mitigation matrix is used when sprinkler systems are used in lieu of fire flow, hydrants provided, and fire access for single-family residences.

5.1.3

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

Justification: This amendment intends to require higher pressure ratings for underground lines that can be fed by Fire Department Connections. Delivery of water at Fire Department Connections can cause pressures that exceed 150 psi. Typically, use of 200 psi rated line can withstand the pressures delivered at the FDC. However, when higher pressures are required at the FDC due to system demands, the underground line is required to be listed for 50 psi above that demand pressure. The 50 psi above design pressure is to allow for pipe to be listed for the pressure used during the hydrostatic test. This is identical to an amendment to NFPA 13, Section 6.1.3.

5.2.1

5.2.1 Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.1 or in accordance with 5.2.2. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to utilize the same limitation on pipe wall thickness as is used in the NFPA 13 standard.

6.4.4

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.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require that an approved engineer report be provided prior to installing fire sprinklers outside of their listing. The base code allows for the installation of fire sprinklers outside of their listing, but does not provide guidance on the limitations of this provision. Requiring the engineer analysis will provide guidance on acceptable methods of installation, even if outside of the listing of the fire sprinkler

6.6.4

6.6.4 Sprinklers shall be installed in any closet used for heating and air-conditioning equipment, washers, dryers, ~~or~~ water heaters, ~~except as permitted by 6.6.7~~ or containing fuel-fired equipment.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to indicate that sprinkler protection is required for areas that contain fuel-fired equipment

6.6.6.1

6.6.6.1 Protection of Fuel-Fired Equipment. ~~When fuel-fired equipment is present, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.~~ Where protection of fuel-fired equipment is required by 6.6.4, 6.6.6 and 6.6.7, sprinkler protection shall be provided in accordance with the following:

(1) At least one quick-response sprinkler with a minimum k-factor of 5.6 shall be provided above the fuel-fired equipment. Sprinklers shall be sufficient to cover the fuel-fired equipment protection area, which is equal to the entire perimeter of the fuel-fired equipment when viewed on a plan view.
(2) Where the sprinkler(s) protecting the fuel-fired equipment is located under a ceiling with slope equal to or greater than a 4:12 pitch, a minimum of one sprinkler shall be located above the edge of the fuel-fired equipment protection area, on the upslope side of the equipment.
(3) Freeze protection shall be provided in accordance with 5.4.2.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to provide minimum design requirements for protection of fuel-fired equipment. Sections 6.6.6 (and proposed 6.6.7) require protection in spaces that contain fuel-fired equipment. However the base code does not provide criteria for protection of these spaces. One interpretation of this code section would indicate that the entire space would need to be provided with fire sprinklers. However, this is not seen as prudent, as it could lead to requiring sprinklers throughout an attic simply due to having a few pieces of fuel-fired equipment in a small portion of the attic. Therefore, this code section is proposed to simply indicate that a minimum of one sprinkler head be located above the fuel-fired equipment. Additional sprinkler heads may be required if there are multiple pieces of equipment, which would together form an area that is called "fuel-fired equipment protection area" and is simply an area with boundaries that contain all fuel-fired equipment within those boundaries. Where there is a slope to the roof, it is felt that the heat from fire will travel up the slope of the roof. Therefore, the proposal requires that in cases where the slope exceeds 4:12, then at least one of the sprinkler heads need to be located at the edge of the protection area on the upslope side, in order to ensure that a head activates. Since many fuel-fired equipment will be located in areas that are subject to freezing, it is helpful to restate that freeze protection must be provided for sprinkler systems designed to NFPA 13R requirements

6.6.7

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

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to address a requirement for protection of fuel-fired equipment. From section 6.6.6 of NFPA 13R, concealed spaces that contain fuel-fired equipment require sprinkler protection within that space. This amendment is intended to extend that level of protection to the closets on the exterior balconies

6.7.2.3.2

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

Justification: The purpose of this amendment is to utilize the same limitation on pipe wall thickness as is used in the NFPA 13 standard

6.8.2

6.8.2 The sprinkler system piping shall not have a separate control valve installed unless supervised by a ~~one of the following methods:~~

(1) Central station, proprietary, or remote station alarm service.

~~(2) Local alarm service that causes the sounding of an audible signal at a constantly attended location~~

~~(3) Valves that are locked open~~

Justification: The purpose of this amendment is to indicate that when sprinkler control valves are installed, they are required to be electrically supervised, and that the other methods of supervision that are listed in base NFPA 13R are not permitted to be used for the purpose of supervision.

6.15

~~**6.15 Drop-Out Ceilings.** Drop-out ceilings shall be permitted to be installed beneath sprinklers where ceilings are listed for that service and are installed in accordance with their listings.~~

Justification: The purpose of this amendment is to eliminate the use of drop-out ceilings below fire sprinklers. The geometry that can occur with drop-out ceilings could lead to unacceptable sprinkler obstructions. This proposal mirrors a similar deletion of drop-out ceilings from NFPA 13

7.1.1.4

7.1.1.4 Systems installed in accordance with the single family residential protection matrix (Section 7.6) shall not require monitoring.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to address the 13R systems that are installed in single-family dwellings for the purposes of size. This does not exempt monitoring of systems installed in single-family homes that are used as care facilities, which are seen as more commercial in nature

7.6

7.6 Protection Matrix for Group R Division 3 Occupancies. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 7.6 shall be applied.

Table 7.6 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC[4]

Building Area Size Range [6]	Mitigation Residential System Type[1,3]	Separate Sprinkler Lead-in Required [5]	Minimum Underground Pipe Size [5]	Minimum Water Meter Size[5]	Sprinklers Required In Areas Subject To Freezing.
< 3,600 sq.ft.	Standard NFPA 13D [2]	See NFPA 13D for design requirements			

≥ 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements	
≥ 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	Yes N/A N/A	Yes
≥ 15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements	

N/A = Not Applicable

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

7.6.1 Enhanced 13R Design. When Table 7.6 requires an Enhanced 13R design, the sprinkler system shall be designed and installed in accordance with NFPA 13R, except that sprinklers shall be installed throughout the structure except where omissions are permitted by the following:

1. Unheated attic spaces that do not contain fuel fired equipment.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.

7.6.2 Other Protection Designs. For other protection designs listed in Table 7.6, see the respective revised codes for NFPA 13 and NFPA 13D minimum design requirements.

Justification: The purpose of this amendment is to provide for minimum protection features for residential homes to still allow application of trade-offs provided for in the Fire Code. For instance, the Fire Code allows reduction in required fire flow for structures when they are fire sprinklered. However, the intent of the typical 13D system for residential is for life-safety purposes only. While the system can provide some property protection, the value of that protection decreases as the home size becomes larger. While there is some comfort in allowing the trade-offs in small homes that are protected solely with the basic NFPA 13D system, this comfort level decreases with larger homes. As such, the protection matrix requires additional protection for larger homes. In particular, homes that are larger than 10,000 square feet require protection in accordance with NFPA 13R.

8.1.7

8.1.7 Sprinkler plans shall indicate the following:

1. Name of owner and occupant.

2. Location, including street address.
3. Point of compass.
4. Ceiling construction.
5. Full height cross-section or schematic diagram, including structural member information if required for clarify and including ceiling construction and method of protection for nonmetallic piping.
6. Ceiling/roof heights and slopes not shown in the full height cross section.
7. Location of fire walls.
8. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
9. Occupancy, label, and name of all ~~each~~ areas or rooms.
10. Location and size of concealed spaces, attics, closets, and bathrooms.
11. Any small enclosures in which no sprinklers are to be installed.
12. Size of city main in street; pressure; whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main; and city main test results including elevation of the test hydrant.
13. Make, manufacturer, model, type, heat-response element, temperature rating, sprinkler identification number, nominal K-factor, number of sprinklers installed, and nominal orifice size of the sprinkler.
~~14. Temperature rating and location of high temperature sprinklers~~
~~15. Number of sprinkler on each riser, per floor~~
14. Type ~~Kind~~ and location of ~~alarm bells~~ horn/strobes.
15. Type of pipe and fittings.
16. Pipe type and schedule of wall thickness.
17. Type of protection for nonmetallic pipe.
18. Nominal pipe size with lengths shown to scale.
19. Location and size of riser nipples.
20. Type of fittings and joints and the location of all welds and bends.
21. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable.
22. All control valves, check valves, drain pipes, and test connections.
23. Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
24. In case of hydraulically designed systems, the information on the hydraulic data nameplate.
25. Name, ~~and~~ address, phone number, and contractor's license number of sprinkler contractor.
26. Nevada State Fire Marshal registration number.
27. Signature and NICET number, or engineer's seal, of the designer.
28. General notes as required by the AHJ.
29. Approximate capacity in gallons of each dry pipe system.
30. Make, type, model, and size of alarm or dry pipe valve.
31. Piping provisions for flushing.
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. A graphic representation of the scale used on all plans.
34. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
35. The minimum rate of water application (density or flow or discharge pressure), the design area of water application, and the domestic demand.
36. The total quantity of water and the pressure required noted at a common reference point for each system.
37. Relative elevations of sprinklers, junction points, and supply or reference points.
38. Information about backflow preventers (manufacturer, size, type).
39. Information about antifreeze solution used (type and amount).
40. Size and location of hydrants, showing size and number of outlets. Static and residual hydrants that were used in flow tests shall be shown.
41. Size, location, and piping arrangement of fire department connections.
42. Location of fuel-fired equipment and heating and air-conditioning equipment.
43. Location of closets on exterior balconies, and a note indicating whether there is any type of door or penetration between the closet and the dwelling unit.

44. Edition year of NFPA 13R to which the sprinkler system is designed.
45. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

Justification: There is little difference in the basic details of information expected to be shown on sprinkler plans submitted to the AHJ, regardless of whether the system is 13D, 13R, or 13 design. However, these three codes have drastically different lists of required information. The intent of this amendment is to update the list of items required on plans so that submittals for 13-R systems are similar to submittals for 13 systems

NFPA 14

3.3.6

3.3.6 High-Rise Building. A building where the floor of an occupiable story is greater than 55 ft (17 m) ~~75 ft (23 m)~~ above the lowest level of fire department vehicle access.

Justification: The intent of this amendment is to define a high-rise the same as is defined by the Building Code and State Fire Marshal regulations.

4.2.3.2

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

Justification: The intent of this amendment is to allow designers the ability to design systems at pressures exceeding 300 psi. Guidance is given to indicate that the maximum pressure occurs when the fire pump is at zero flow. Schedule 40 is required for higher pressures to ensure pipe suitability and should extend the service life.

4.6.1.1.1

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

Justification: The intent of this amendment is to require additional clearance around the hose valve and the hose outlet. 6 inches is required above the face of the valve. The intent of this dimension is to allow hand access to reach over the valve to allow a grip of the valve. 6 inches is required around the outlet to accommodate the use of a spanner wrench for loosening the outlet cap.

4.8.2

4.8.2 Each fire department connection shall have at least two, and not less than one for each 250 gpm of system demand or fraction thereof, 2 ½ inch (65 mm) internal threaded fittings having NHS threads, as specified in NFPA 1963, *Standard for Fire Hose Connections.* 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 purposes of this section, internal clapper valve devices provided by the manufacturer in listed Fire Department Connections shall be considered internal check valves. *(See Section 7.7 and 7.12 for design requirements)*

Justification: This amendment is new. This amendment requires additional inlets on FDCs to provide a minimum of one for each 250 gpm of flow. The 250 gpm per inlet is derived from manufacturer specification data on preassembled FDCs. The internal check valves are being required to deal with field fabricated FDC assemblies. This mirrors amendments made to NFPA 13.

4.8.2.3

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

Justification: The purpose of this amendment is to define the minimum diameter of the FDC line. The break between 4 in and 6 in follows from manufacturer specifications, where preassembled FDCs with four or more inlets have a 6 in outlet. This is similar to amendments made to NFPA 13. Where system design requires supply lines that exceed 6 inches, the proposal requires that the FDC supply line be equal in size to that supply line

5.2.1.2.1

5.2.1.2.1* Piping volume shall not be limited where the system is designed in accordance with Section 5.2.1.2.2. ~~Not more than 750 gal (2839 L) system capacity shall be controlled by one dry pipe valve.~~

Justification: The purpose of this amendment (and the companion amendment to NFPA 14 Section 5.2.1.2.2) is to require all systems to meet a 3 minute delivery time, and thus allow dry systems to not be limited. Base NFPA 14 already allows for a system to be unlimited when the 3 minute delivery time is provided. However, base NFPA 14 does not provide a time limit for systems with volume less than 750 gallons. Excessive wait times can be detrimental to suppression crews. The effect of this change is to require all dry standpipe systems to meet a 3 minute delivery time.

5.2.1.2.2

5.2.1.2.2 ~~Piping volume shall be permitted to exceed the requirements of 5.2.1.2.1 where the~~ System design shall be ~~is~~ such that water is delivered to the system at the most remote hose connection in not more than 3 minutes, starting at the normal air pressure on the system and at the time of fully opened hose connection.

Justification: The purpose of this amendment (and the companion amendment to NFPA 14 Section 5.2.1.3.1) is to require all systems to meet a 3 minute delivery time, and thus allow dry systems to not be limited. Base NFPA 14 allows for a system to be unlimited when a 3 minute delivery time is provided. However, base NFPA 14 does not provide a time limit for systems with volume less than 750 gallons. Excessive wait times can be detrimental to suppression crews.

6.3.2.1

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

Justification: The intent of this amendment is to require individual control valves in situations where a control valve is fed directly from the feed main. An instance occurred where a hose valve was fed from the feed main and no control valve was present. Maintenance of this hose valve necessitated the shutting down the entire system to the casino and the hotel tower, draining the entire system, replacing the hose valve, and finally filling the system back up. Not having a control valve caused the system to be out of service for approximately 6 hours. The base code Section 6.3.2 seems to indicate that a valve would be required, but this amendment clearly sets forth the requirement.

6.3.7.1

6.3.7.1 System water supply valves, isolation control valves, and other valves in feed mains shall be electrically supervised in an approved manner in the open position by ~~one of the following methods:~~

~~(1) A~~ a central station, proprietary, or remote station signaling service

~~(2) A local signaling service that initiates an audible signal to a constantly attended location~~

~~(3) Locking of valves in the open position~~

~~(4) Sealing of valves and an approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner~~

Justification: This amendment is new. The intent of this amendment is to require that standpipe control valves be monitored electrically at a central, proprietary, or remote station. There is concern about maintenance of the other methods described herein. This mirrors an amendment made to NFPA 13.

6.4.5.2.2

~~**6.4.5.2.2** A sign also shall indicate the pressure required at the inlets to deliver the system demand~~

Justification: The purpose of this deletion is to coordinate with the amendment for Section 6.4.5.3. Note that the proposed 6.4.5.3 includes a requirement to put the minimum required pressure on a sign. As such, the base code section 6.4.5.2.2 becomes redundant and is not required.

6.4.5.3

6.4.5.3 Signs shall be provided at fire department connections, indicating the areas of the building served and the minimum required pressure and flow to be delivered through the inlets. Where a fire department connection services multiple buildings, structures, or locations, ~~a~~ the sign shall ~~be provided~~ indicate ~~indicating~~ the buildings, structures, or locations served.

Justification: The purpose of this amendment is to provide minimum information necessary for responding personnel to utilize the FDC. This amendment is a companion to the deletion of Section 6.4.5.2.2.

6.4.5.3.1

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

Justification: The purpose of this amendment is to define criteria for signage that is required by section 6.4.5.3

7.2.1

7.2.1 The maximum pressure at any point in the system at any time shall not exceed 350 psi (24 bar), except where components are rated for higher pressures and are approved by an alternative materials and methods report approved by the authority having jurisdiction.

Justification: The purpose of this amendment is to allow for higher pressures in standpipe systems, so long as the components are rated for such use and are approved by a specific report to address the system design. Forthcoming NFPA 14 and NFPA 20 editions are going to force higher pressures in standpipe systems. Further, there is a desire to allow higher pressures in systems, to allow FDC operations to be conducted from ground level all the way to throughout a building. This amendment will allow for use of new standards and will accommodate FDC operations throughout the building

7.2.3.2

7.2.3.2 Where the static pressure at a 2½ in. (65mm) hose connection exceeds 200 psi (13.9 bar) ~~175 psi (12.1 bar)~~, an approved pressure regulating device shall be provided to limit static and residual pressures at the outlet of the hose connection to 200 psi (13.9 bar) ~~175 psi (12.1 bar)~~.

Justification: The purpose of this amendment is to allow higher pressures on the 2-1/2 inch hose valves. There are many reasons for this. First, the equipment carried by firefighters in this jurisdiction is capable of sustaining higher starting/shut-off pressures. Further, by allowing higher static pressures, it is easier for commercially available PRV hose valves to be designed and still meet the 125 psi minimum static pressure

7.2.3.4

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

Justification: The intent of this amendment is to restrict the use of direct-acting pressure reducing valves to only those that are capable of being field adjusted. There is concern about the maintenance of pressure-reducing valves, and a desire to provide valves that can be adjusted in the field to meet the needs of responding personnel. This amendment limits direct-acting pressure reducing devices to those that can be adjusted by the field

7.2.4

7.2.4 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 7.2.4. 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) Regulating devices shall be arranged so that the failure of any single device does not allow pressure in excess of 200 ~~175~~ psi (13.9 ~~12.1~~ 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 7ft 6in (2.31 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 ~~to the system side of the outlet isolation valve.~~

(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 ~~in accordance with manufacturer recommendations~~.

(9) Remote monitoring and supervision for detecting high pressure failure of the pressure of the pressure-regulating device shall be provided in accordance with *NFPA 72, National Fire Alarm Code*. Such failure shall be detected by providing a supervisory flow switch downstream on the pressure relief valve.

(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.

Justification: The purpose of this amendment is to provide design criteria for the zone pressure-regulating stations.

Item (1) is amended by requiring that pressure-regulating devices (PRDs) be provided for the full range of anticipated flow, and to require redundancy for each required pressure-regulating device. The purpose for stipulating full range of anticipated flow is to address the most common mistake in sizing PRDs, which is to oversize the device. PRDs have a minimum flow. Therefore, a 6-inch PRD may be able to flow up to 1,000 gpm to satisfy the standpipe requirement, but that 6-inch PRD likely will not flow less than 100 gpm. If the system is expected to supply sprinklers, then small diameter PRDs (say 2-inch diameter) must be provided to allow for flow through of the lowest expected flow. Redundancy is required to address failures that occur with PRDs. PRDs will fail open or will fail close. Providing an automatic bypass to address when a PRD fails closed is addressed by the redundancy requirement.

Item (2) is amended by requiring control valves on both sides of each PRD, and to require that the control valves be provided in a manner to not disable flow through other devices. This is intended for guidance purposes, and to allow for maintenance of any one PRD without disabling the entire supply to the zone.

Item (3) is amended to allow the pressure to be 200 psi at hose valves, consistent with other amendments to NFPA 14.

Item (5) is amended to require the bypass valve to be within 7ft 6 in of the floor. Man access to the control valve is seen as vital, in case the valve needs to be manipulated during an event.

Item (7) is amended to clarify that the fire department connection (FDC) feeds the standpipe risers at the base of the building, and does not feed individual zones after the PRDs. The base code seems to require a FDC supply to each zone, which requires substantial lengths of piping to be sent to all PRDs throughout the building. This is excessive piping, the full volume of which needs to be pressurized in order to allow the FDC to supply flow and pressure to the zone.

Item (8) is amended to provide guidance as to the size of the pressure relief valve, requiring that the relief valve be sized to flow the full anticipated system flow, and to the design of the pressure relief valve, requiring that the relief valve be set to allow a maximum of 200 psi at hose connections on that zone.

Item (9) is amended to provide guidance as to how to detect failure of PRDs. Two methods are required. One is to require a flow switch for piping from the pressure relief valve, indicating that the pressure relief valve has experienced sufficient pressure to open. The second method is to require a pressure switch downstream of the PRDs. The pressure switch is set to 125% of the PRD setting.

Item (10) is added to require a drain line that will be used for testing of the PRD. In addition, this drain line can serve as discharge piping for the pressure relief valve

7.3.2

7.3.2 Class I Systems. Class I systems shall be provided with 2 ½ in. (65 mm) hose connections in the following locations:

(1) At the main floor landing in exit stairways

(2) On each side of the wall adjacent to the exit openings of horizontal exits, unless permitted to be omitted by the Fire Code

(3) In other than covered mall buildings, in each exit passageway at the entrance from the building areas into the passageway

(4) In covered mall buildings, at the entrance to each exit passageway or exit corridor, and at the interior side of public entrances from the exterior to the mall

(5) At the highest landing of stairways with stairway access to a roof, or on roofs with a slope of less than 4 in 12 where stairways do not access the roof

Justification: The Fire Code allows for the exclusion of hose valves at horizontal exits where the area to be covered by that outlet would already be covered by outlets located in rated stairs. This change to Item (2) is to bring NFPA 14 into conformity with the Fire and Building Codes

7.3.2.2

7.3.2.2 Class I hose systems shall be designed so that all floor areas of the floor or story are protected by hose valve coverage, with travel distance limited to 100 feet of hose and 30 feet of stream from each hose valve connection. ~~Where the most remote portion of a nonsprinklered floor or story, is located in excess of 150 ft (45.7 m) of travel distance from a hose connection in or adjacent to a required exit or the most remote portion of a sprinklered floor or story is located in excess of 200 ft (61 m) of travel distance from a hose connection in or adjacent to required exit, additional hose connections shall be provided, in approved locations, where required by the local fire department or the AHJ.~~

Justification: The purpose of this amendment is to require that Class I valves are provided to protect all floor areas, with spacing dictated by 100 feet of hose and 30 feet of stream being available from each hose valve. The last phrase regarding "where required by the…" is deleted to avoid questions from arising, as there is no question that such additional hose valves that may be required for full coverage are required

7.3.3.1

7.3.3.1 Class II systems shall be provided with 1 ½ in. (40 mm) hose stations so that all portions of each floor level of the building or area thereof required to be protected are within 130 ft (39.7 m) of a hose connection provided with 1 ½ in. (40 mm) ~~hose or within 120 ft of a hose connection provided with less than 1 ½ in (40 mm) hose~~.

Justification: The purpose of this amendment, in two parts, is to address local use of Class II hose stations. The first part addresses the requirement for Class II hose protection throughout the floor. Class II hose stations are provided solely for assembly areas in accordance with the IFC. When Class II hose stations are provided, they are only required to protect a portion of the building. The second part of the amendment addresses the hose diameter. This code section seems to imply an allowance for hose diameter less than 1 ½ inch, with no lower limit. Hose with diameter less than 1 ½ inch is not permitted for Class II hose stations, so the second part of the amendment removes the confusing language

7.4

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

Justification: The purpose of this amendment is to address construction of scissor stairs. Scissor stairs are two separate stair paths, with separate stair landings, that coexist in one stairway. This amendment clarifies that separate hose valves are required to be located on the separate stair landings

7.8.1

7.8.1 Minimum Design Pressure for Hydraulically Designed Systems. Hydraulically designed standpipe systems shall be designed to provide the waterflow rate required by Section 7.10 at a minimum residual pressure of 125 psi ~~100 psi~~ (8.6 ~~6.9~~ bar) at the outlet of the hydraulically most remote 2 ½ in. (65 mm) hose connection and 65 psi (4.5 bar) at the outlet of the hydraulically most remote 1 ½ in. (40 mm) hose station.

Justification: The purpose of this amendment is to require a minimum residual pressure of 125 psi. This minimum pressure is required in order to address the worst case pressure requirement from the hose packs in the Las Vegas Valley

7.8.1.2

7.8.1.2 Manual standpipe systems shall be designed to provide 125 psi (8.6 bar) ~~100 psi (6.9 bar)~~ at the topmost outlet with the calculations terminating at the fire department connection.

Justification: This change is to require a minimum residual pressure of 125 psi at the standpipe outlets. This is necessary to address the hose packs commonly used in the valley

7.9.1.3

7.9.1.3 Where pumps are used in structures with an occupied floor located greater than 250 ft in height above the lowest level of fire department access, a redundant fire pump shall be provided for each required fire pump.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require redundant fire pumps for tall buildings. The purpose of this is to ensure reliability in the building. The fire pump is vital in high-rise buildings, so providing a redundant pump is important in order to ensure that the fire pump capacity is maintained

7.11.1.1

7.11.1.1 The drain riser shall be equipped with tees that are of the same size as the discharge outlets of the pressure-regulating devices to be tested with internal threaded swivel fitting having NHS threads, as specified in NFPA 1963, *Standard for Fire Hose Connections*, with plugs, and shall be located ~~on~~ at ~~least~~ every ~~other~~ 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.

Justification: The purpose of this amendment is to ensure that a drain connection is provided at each pressure-regulating device to facilitate testing. Pressure-regulating devices are sensitive equipment that require care in commissioning and regular maintenance. A drain connection is necessary for both the commissioning and maintenance of pressure-regulating devices. In order to ensure that pressure-regulating devices are easy to commission and test, this code section requires that a drain connection be provided adjacent to every pressure-regulating device, even if that device is not attached directly to a vertical riser.

7.11.1.3

7.11.1.3 Where drain risers are interconnected and run to a common discharge point, all piping shall be sized for the maximum possible combined flow.

Justification: The purpose of this amendment is to ensure that the combined flow used for sizing of the interconnecting piping accommodates possibility of multiple drain lines being flowed simultaneously.

7.12.1.1

7.12.1.1 In buildings with multiple pump zones, each zone shall be provided with an express main and fire department connection from the street to each pump zone. ~~The high zone fire department connection(s) shall not be required to be provided where 7.9.3 applies.~~

Justification: The purpose of this amendment is to ensure that all pressure zones can be supplied from a fire department connection

7.12.2.1

~~**7.12.2.1** A single connection for each zone shall be permitted where acceptable to the fire department~~

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to clarify for the user that allowing a single FDC is not acceptable to the AHJ.

7.12.3

7.12.3 Fire department connection sizes shall be based on the greater of the sprinkler system demand (if a combined system) or the standpipe system demand and shall include one 2 ½ in. (65 mm) inlet per every 250 gpm (946 L/min)

Justification: The purpose of this amendment is to require analysis of the sprinkler demand when sizing the FDC for combined systems. This correlates to the amendments made to section 6.8.1.4 of NFPA 13.

7.12.3.1

~~7.12.3.1 An approved large diameter hose connection of a size to accommodate the required flow shall be permitted.~~

Justification: The purpose of this amendment is to disallow FDC inlets that are greater than 2 ½ inch, as are required in Section 7.12.3. The use of large diameter FDC's are not permitted.

8.1.1

8.1.1 Plans accurately showing the details and arrangement of the standpipe system shall be furnished to, reviewed, and stamped accepted by the authority having jurisdiction prior to the installation of the system.

Justification: The purpose of this amendment is to clearly indicate that AHJ acceptance of plans is required prior to the installation of the system.

8.1.2

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

~~(1) Name of owner(s) and occupant(s)~~
~~(2) Location, including street address~~
~~(3) Point of Compass~~
~~(4) Name and address of installing contractor~~
~~(5) For automatic and semiautomatic standpipe systems, the following:~~
~~(a) Size of city main in street and whether dead end or circulating; if dead end, direction and distance to nearest circulating main~~
~~(b) City main test results and system elevation relative to test hydrant~~
~~(6) For automatic and semiautomatic standpipe systems, other sources of supply, with pressure and elevation~~
~~(7) Approximate capacity of each dry 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~~

~~(g) Time~~
~~(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 lights of pipe (or center-to-center dimensions)~~
~~(11) Type of fittings and joints and location of all welds and bends~~
~~(12) Type and location of hangers, sleeves, braces, and methods of securing pipe~~
~~(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 outlest, hand hose, nozzles, cabinets, and related equipment~~
~~(17) Information on the hydraulic data plate~~
~~(18) Hydraulic reference points shown on plan that correspond with comparable reference points on the hydraulic calculation sheets~~
~~(19) The setting for pressure reducing and pressure restricting valves~~
~~(20) For automatic and semiautomatic standpipe systems, size and location of hydrants, including static and residual hydrants used in flow test~~
~~(21) Size, location, and piping arrangement of fire department connections~~
~~(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 outlet~~
~~(26) Location of hose valves used in hydraulic calculations~~
~~(27) Standpipe system demand (flow and pressure) at the following locations:~~
~~(a) Fire department connection (FDC) inlet~~
~~(b) Fire pump discharge flange~~
~~(c) Water supply truck discharge~~
~~(d) Water supply source if different from (a) through (c)~~

1. Provide a detailed narrative describing the scope of work to be conducted associated with the plans.
2. Name of owner and occupant.
3. Location, including street address.
4. Name address, phone number, and contractor's license number of sprinkler contractor.
5. Nevada State Fire Marshal registration number.
6. Signature and NICET number, or engineer's seal, of the designer.
7. General notes as required by the AHJ.
8. Point of compass.
9. The plan must show a top view of all areas on a common architectural scale, i.e. 1/8", 3/16", 1/4", etc. All walls and doors need to be shown, and each room must be labeled according to use. The top view must show 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. The coverage area shall be shown on plans and be measured along the path of travel from hose valves, around walls and through doors, to the most remote areas of the floor. The 30 feet distance assigned to the hose stream shall not be allowed to bend or turn.
10. The plan must show section views with a riser diagram to describe the locations of mains, lines, and hose valves within the structure. A minimum of one view is required, although additional views may be necessary to determine compliance with NFPA 14. The section view must be drawn to a common architectural scale, i.e. 1/8", 3/16", 1/4", etc. The riser diagram must indicate all components on the riser, including fire department connections; water supply components, including fire pumps and supply lines; interconnecting horizontal pipe; all standpipes on the system; control valves at the base of all standpipes; hose valves fed by the standpipes; and, where required for testing of pressure regulating valves, the drain lines.
11. The plans shall include an isometric view showing the entire system in one view.
12. A graphic representation of the scale used on all plans.

13. Ceiling construction.
14. Full height cross section.
15. Location of fire walls.
16. Location of horizontal exits.
17. Location of partitions.
18. Label and name of each area or room.
19. General notes shall be provided, as follows:
    a. Indicate compliance with NFPA 14.
    b. Indicate the type of system per Section 5.2 and the class of the system per Section 5.3.
    c. Indicate the minimum and maximum pressure requirements for the system.
    d. Indicate the minimum flow for the system and for each individual valve.
    e. Provide a description of hose valves used, detailing the manufacturer, model number(s), and outlet size.
    f. Manufacturer, schedule and type of piping.
    g. Manufacturer and type of fittings.
    h. Type of freeze protection (building heated, dry system, anti-freeze system, heat-trace, etc).
    i. Indicate the pressure required for the hydrostatic test, being 200 psi or 50 psi about pump churn pressure, whichever is higher.
    j. Indicate the quantity of hose valves shown on the submittal.
20. Underground pipe size, length, location with respect to the building, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade. Show the locations of fire hydrants used for water supply to the fire department connection(s), indicate the test and flow test results and label the test and flow hydrants.
21. Provide information regarding the fire pump, as applicable.
22. Other sources of water supply, including water storage tanks and fire department connections, shall be shown on plans.
23. Size, location, and piping arrangement of fire department connections, with details of the connection.
24. Fire Department Connection Signage: A sign shall be provided adjacent to each FDC indicating what systems are being served, what areas of the building are served, and the minimum required pressure and flow at the Fire Department Connection for correct system operation. Provide a detail of this sign on the plan.
25. Detail of Class I. Class II, or Class III hose valves located in cabinets. The cabinet size, and the placement of items within the cabinet, shall be such to provide a minimum clearance of 6 inches perpendicularly from the face of the valve, a minimum of 1 inch around the circumference of the valve, and a minimum of 6 inches around the circumference of the hose outlet cap.
26. Type of pipe and fittings.
27. Pipe type and schedule of wall thickness.
28. Nominal pipe size with lengths shown to scale.
29. Type of fittings and joints and the location of all welds and bends.
30. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable.
31. Show hanger locations, and provide details of hanger installations.
32. Seismic bracing information shall be provided, including locations, details, and calculations.
33. 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.
34. Provide details for all penetrations in rated walls and floors, providing information regarding the method of maintaining fire rating of the wall or floor.
35. All control valves, check valves, drain pipes, and test connections.
36. Make, type, model, and size of alarm or dry pipe valve.
37. Piping provisions for flushing and for testing.
38. 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.
39. A detail of the hydraulic data nameplate.
40. Hydraulic reference points shown on the plan, including the top view, section view, and isometric view, that correspond with comparable reference points on the hydraulic calculation sheets.

41. The total quantity of water and the pressure required noted at a common reference point for each system.
42. Edition year of NFPA 14 to which the standpipe system is designed.
43. Pressure Reducing Valves: For all pressure reducing valves, including direct-acting and pilot-operated valves, which are shown on the plans, indicate the make, model, and setting of the pressure-reducing valve, and provide a detail for each unique installation configuration.
44. 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 the 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 hose valves on each floor. Provide a supporting hydraulic calculation at full standpipe design flow per NFPA 14 (750 or 1,000 gpm), providing a node on each floor level to indicate the residual pressure at each hose valve.
    d. Residual Pressure, 250-gpm flow, inlet - Indicate the residual pressure at the inlet of hose valves on each floor while flowing 250 gpm. Provide a supporting hydraulic calculation at 250 gpm 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 pressure relation charts provided by the manufacturer. For non-PRV installation, 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 250 gpm. This is necessary to establish the residual pressure expected during field inspection. For PRV installations, the residual pressure is taken from pressure relation charts provided by the manufacturer.

Justification: This amendment provides a list of the items required for submittal of standpipe plans. It includes many items required by the base code, and adds in items that are commonly required in the valley.

11.5.7.2

11.5.7.2 The system shall deliver a minimum of 250 gpm (946 L/min) at the hose connection within 3 minutes of opening the hose valve. ~~if the system capacity exceeds 750 gal (2480 L)~~

Justification: The purpose of this amendment is to indicate that a maximum of 3 minutes is permitted from the time of opening a hose to the time that water is delivered to the hose valve. This coincides with changes made to Section 5.2.1.2.

12.7.2

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

Justification: The purpose of this amendment is to allow the AHJ the ability to approve temporary standpipes without requiring freeze protection of piping during periods of construction. In this jurisdiction, many water-based suppression systems, including standpipe systems, are subjected to the elements. This can be considered acceptable during periods of construction, due to the short time period that the systems are not protected. Due to the local climate, the risk of damage to system piping from freezing is substantially low, enough that the extra cost of freeze protection is not warranted. In cases where a project is stalled midstream, where the period of time where the piping is not protected is possibly unlimited, the AHJ can simply remove the exception, and go back to requiring the freeze protection as required. Revising this section does not prohibit the owner or contractor from adding freeze protection if such protection is desired

NFPA 20

3.3.24

3.3.24 High-Rise Building. A building where the floor of an occupiable story is greater than 55 ft (16.8 m) ~~75 ft (23 m)~~ above the lowest level of fire department vehicle access.

Justification: Section 3.3.24 is a new section to NFPA 20, and is an extract from NFPA 5000. The local jurisdictions have changed the definition of a high-rise building to have a height of 55 feet instead of 75 feet. The purpose of this amendment is to be in conformance with the other locally adopted codes. This change is longstanding in the State of Nevada, having been established after the MGM and Hilton fires of the early 1980's, as part of the retrofit laws for defining and protecting high-rise buildings.

4.1.1

4.1.1 Where a pump is used to provide booster pressure supply to multiple structures, a redundant fire pump shall be provided for each required fire pump.

Justification: The purpose of this amendment is to require redundant fire pumps when multiple buildings are serviced by one fire pump system. The purpose of this is to ensure reliability for buildings not intimately involved with a fire scenario. Where required, the fire pump is vital for protection of buildings, so providing a redundant pump is important in order to ensure that the fire pump capacity is maintained. If a single pump is used and fails during a fire, although only one building is damaged from the fire, all of the buildings would lose protection due to the failed fire pump. Providing a redundant pump helps to avoid this situation

4.10.1.1

4.10.1.1 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.

Justification: Liquid-filled gauges are easier to read due to the stability of the needle during flow and are more accurate than standard gauges. The intent of this amendment is to prohibit the use of standard gauges, and to allow only liquid-filled gauges for fire pump installations

4.10.2.1

4.10.2.1 Unless the requirements of 4.10.2.4 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.

Justification: Liquid-filled gauges are easier to read due to the stability of the needle during flow and are more accurate than standard gauges. The intent of this amendment is to prohibit the use of standard gauges, and to allow only liquid-filled gauges for fire pump installations

4.12.1.3

4.12.1.3 Fire Pump Buildings or Rooms ~~with Diesel Engines.~~ Fire pump buildings or rooms ~~enclosing diesel engine pump drivers and day tanks~~ shall be protected with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

Justification: The purpose of this amendment is to require that fire sprinkler protection be provided in all fire pump rooms. The base code already requires this protection for diesel fire pumps. This amendment will extend that protection to electric fire pumps. The intent of this amendment is to provide protection for the fire pump equipment.

4.12.3.1

4.12.3.1 An approved or listed permanently installed (hard-wired for electrically powered devices) source of heat shall be provided for maintaining the temperature of a pump room or pump house~~, where required,~~ above 40° F (5° C).

Justification: The purpose of this amendment is to definitively require heating be provided, and to indicate that the source of heat must be permanently installed. Due to the climate of this locality, freeze protection by way of heating is required. Further, to address insufficient installation practices of the past, the phrase "Permanently Installed" is added

4.12.4

4.12.4 Normal Lighting. Artificial permanently installed lighting shall be provided in a pump room or house.

Justification: The purpose of this amendment is to require that lighting is added as part of the building electrical system, not as an appliance that can be plugged into an electrical outlet

4.14.4.1

4.14.4.1 ~~Where the suction supply is of sufficient pressure to be of material value without the pump~~, ~~the~~ All pumps supplied by municipal water supply shall be installed with a bypass. *(See Figure A.4.14.4.)*

Justification: The purpose of this amendment is to require a bypass on all fire pumps, whether or not it is apparent that city supply can be of a benefit. This amendment removes the ambiguity about whether to install a bypass.

5.1.1.3

5.1.1.3 Where pumps are used in structures with walking levels greater than 250 ft in height about the lowest level of fire department access, a redundant fire pump shall be provided for each required fire pump.

Justification: The purpose of this amendment is to require redundant fire pumps for tall buildings. The purpose of this is to ensure reliability in the building. The fire pump is vital in high-rise buildings, so providing a redundant pump is important in order to ensure that the fire pump capacity is maintained.

9.3.1

9.3.1 ~~Except for an arrangement described in 9.3.3,~~ At least one alternate source of power shall be provided when the requirement of 9.3.3 is not satisfied. ~~height of the structure is beyond the pumping capacity of the fire department apparatus~~.

Justification: The intent of this amendment is to require secondary power for all electrical fire pump installations. There are ongoing concerns about the reliability of the electrical service in this jurisdiction. Further, the majority of power feeds in this jurisdiction occur over overhead power lines, which is one of the items used by NFPA 20 for guidance as to what constitutes reliable power. These concerns exist in all buildings protected with electric fire pumps, regardless of height. Due to the combination of these issues, the committee feels this amendment is warranted.

9.3.4

9.3.4 When 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 distinctly independent of the normal source of power. Any connections to the public utility shall be considered a single source of power and subsequently cannot be utilized as both normal power and the alternate (backup) power.

Justification: The purpose of this amendment is to clearly indicate that the secondary source of power must be independent of the public utility power supply. Many projects provide a second source of power feed from the public utility, and consider the second source of power as an emergency back-up power feed. However, since both the primary and secondary source of power in those situations come from the public utility, neither source of power satisfies the secondary power requirements of NFPA 20

10.2.1

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 by locating controllers near the entrance to the room.

Justification: This solves an enforcement issue of ensuring the fire pump controllers are located in such a manner as being readily accessible and not buried in the back of the room where one has to duck under, up, over, around piping, valves and equipment. This requirement will guide the location of fire pump controllers in a manner to be readily accessible. Further, new language is added to reiterate that the fire pump controller must meet clearance requirements of the NEC.

10.4.7.1.1

10.4.7.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

Justification: The purpose of this amendment is to require that fire pump signals are provided in the Fire Command Center in a manner that is easy to read. The panels provided by fire pump manufacturer are easier to navigate than fire alarm systems are. This change is intended to provide information more easily to responding personnel. The signals are still required to be tied to the fire alarm control panel, which will be monitored either by central station or by proprietary monitoring.

12.2.1

12.2.1 Controllers shall be located as close as is practical to the motors they control and shall be within sight of the motors. Controllers shall be readily accessible by locating controllers near the entrance to the room.

Justification: This amendment is intended to provide consistency for regional application of codes. in part. This solves an enforcement issue of ensuring the fire pump controllers are located in such a manner as being readily accessible and not buried in the back of the room where one has to duck under, up, over, around piping, valves and equipment. This requirement will guide the location of fire pump controllers in a manner to be readily accessible. Further, new language is added to reiterate that the fire pump controller must meet clearance requirements of the NEC.

12.4.2.1.1

12.4.2.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require that fire pump signals are provided in the Fire Command Center in a manner that is easy to read. The panels provided by fire pump manufacturer are easier to navigate than fire alarm systems are. This change is intended to provide information more easily to responding personnel. The signals are still required to be tied to the fire alarm control panel, which will be monitored either by central station or by proprietary monitoring

NFPA 22

5.1.1.1

5.1.1.1 Steel tanks shall be designed in accordance with AWWA D100, *Welded Steel Tank for Water Storage*, 1996, or AWWA D103, *Factory-Coated Bolted Steel Tanks for Water Storage*, 1997.

Justification: This amendment is established to address committee concerns. The documents referenced here are from Annex C of NFPA 22. The intent is to require higher standards of construction for above-ground steel tanks. There have been instances in this jurisdiction where above-ground steel square tanks have buckled under the weight of the water. There is concern about the reliability of these tanks. As such, a higher standard is needed, and is provided by this amendment.

14.4.1

14.4.1 A permanent ~~pipe connected~~ connection to ~~a~~ an approved water supply shall be provided to fill the tank. Where the tank serves as a break tank between the city supply and fire pump(s), the fill shall be through automatic fill valves that are tied to water level sensors, and a bypass line of equal size with a normally closed control valve shall be provided.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to require that the permanent pipe go through an auto-fill valve for tanks used as break tanks. This is common with vertical turbine pumps. Further, a bypass with control valve is required in case of failure of the automatic fill valve.

14.4.2

14.4.2 The means to fill the tank shall be sized to fill the tank in a maximum time of 8 hours. Where the tank serves as a break tank between the city supply and building fire pump(s), the means to fill the tank shall be automatic and shall provide supply flow equal to 150% of the fire pump rated flow.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to address situations where the city supply to fire pumps is routed through the secondary supply water tank. This is common for facilities that use vertical turbine pumps. The purpose of this amendment is to clarify that when the tank serves as a break tank between the city supply and any fire pump(s), then the flow of the fill line needs to be such that it can support the full flow capability of the fire pump.

14.5.5

14.5.5 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.

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to ensure that water from the overflow does not dump interior to a building. There have been some installations where the overflow pipe discharged directly into a fire pump room. By providing this code section, such installations will be prevented.

14.8.1

14.8.1 Provisions shall be made for the installation of sensors in accordance with *NFPA 72* for two critical water temperatures and two critical water levels.

14.8.1.1 Where the water storage tank acts as a break tank between the city supply and fire pump(s), water level sensors shall be provided. A minimum of three sensor levels shall be provided. Two sensor levels shall activate the turn-on/turn-off of the fill valve. The third sensor level shall indicate a low level alarm. The sensor that opens the fill control valve shall be set 5 inches (127 mm) below normal (full) level, or at 90% of the normal (full) volume, whichever leaves the greater volume in the tank. The sensor that closes the fill control valve shall be set at normal (full) level. The sensor that signals a low alarm shall be set 12 inches (300 mm) below normal (full) level, or at 70% of the normal (full) volume, whichever leaves the greater volume in the tank. The low level alarm shall be transmitted to a constantly attended location to initiate response to the fill control bypass valve

Justification: This amendment is established to address committee concerns. The purpose of this amendment is to clarify where float sensors are required in water tanks that are used for secondary water, specifically when those tanks are between the city water supply and the fire pump(s). This is common with vertical turbine fire pumps. The fill control valve needs two sensors, to basically tell the valve when to open to fill the tank, and then to tell the valve to close when the tank is filled. The third sensor is required in case the fill control valve does not operate, in order to signal someone to open the bypass valve.

NFPA 24

6.6.2

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

(1) On each bank where a main crosses water

(2) Outside the building foundation(s) where a main or a section of a main runs 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

Justification: This amendment is established to address committee concerns. The purpose of the amendment is to specify locations of sectional valves on private mains. The purpose of the additional sectional valves is to allow for service to continue to as many fire hydrants and fire sprinkler systems as possible when there is a break in the underground line that requires maintenance.

NFPA 72

3.3.99

3.3.99 False Alarm. Activation or reporting of an alarm for which no such alarm condition, fire or emergency actually exists. Additionally, False Alarm is the willful and knowing initiating or transmission of a signal, message or other notification of an event of fire when no such danger exists. See 3.3.307, Unwanted Alarm.

Justification: The definition for nuisance alarm was addressed in NFPA 72. The addition of false alarm will provide understanding of said condition. False alarm is defined in the IFC, but not defined in NFPA 72 where it is needed. NFPA 72 provided definitions of four different types of unwanted alarms: Malicious; Nuisance; Unintentional; and Unknown. Adding this definition will more closely match the IFC definition.

3.3.105.4.2

3.3.105.4.2 ***Dedicated Function Fire Alarm System.*** A protected premises fire alarm system installed specifically to perform emergency control function(s) where a building fire alarm system is not required. Such systems include, but are not limited to sprinkler monitoring systems and elevator recall systems. (SIG-PRO)

Justification: This amendment is intended to clarify and provide examples to designers as to what the AHJ's consider to be dedicated function fire alarm systems in order to eliminate confusion.

10.4.4

10.4.4* In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

Exception No. 1: Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.

Exception No. 2: Dedicated function fire alarm systems shall not be required to have smoke detectors installed above the dedicated function fire alarm control unit.

Justification: This section is limited to an approved fire alarm system including full notification throughout. Dedicated function fire alarm systems are not permitted to have full notification throughout. Therefore exception two is added to clarify that smoke detectors are not required above control units in dedicated alarm systems.

12.2.4

12.2.4* The installation of all pathway wiring, cable and equipment shall be in accordance with *NFPA 70, National Electric Code* and the applicable requirements of 12.2.4.1 through 12.2.4.4. In all occupancies, other than residential two stories or less, all wiring, including optical fiber cables, shall be in enclosed metallic conduit or shall be MI, MC, or AC cable. (SIG-FUN)

Justification: Installing critical wiring within metallic conduit provides physical protection from damage, increases survivability of the wiring, and assists with the inspection process of installed systems. If wiring is approved by the Building Official to be abandoned in place, (see electrical code amendment), it does not become a combustibility concern.

17.5.3.1

17.5.3.1 Total (Complete) Coverage. Where required by other governing laws, codes, or standards, and unless otherwise modified by 17.5.3.1.1 through 17.5.3.1.5, total coverage shall include all rooms, halls, storage areas, and basements. Attics, lofts, spaces above suspended ceilings, and other subdivisions and accessible spaces as well as the inside of all closets, elevator shafts, enclosed stairways, dumbwaiter shafts, and chutes shall also have detectors if required by the authority having jurisdiction or to satisfy performance design criteria. Inaccessible areas may not be required to be protected by detectors.

Justification: When total coverage is required by another standard, normally the intent is to detect the products of combustion quicker to provide quicker notification. In Southern Nevada attics, lofts, spaces above suspended ceilings and other subdivision are areas that are environmentally unfriendly to initiating devices. Additionally initiating devices installed in these areas require more frequent maintenance, and are more prone to false or nuisance alarms. Therefore the code committee determined that detection in these spaces could be normally eliminated.

17.5.3.1.6

17.5.3.1.6 When area detectors are installed instead of duct smoke detectors to comply with the Uniform Mechanical Code, total coverage is defined as the area served by the air-moving equipment.

Justification: Total coverage in lieu of duct smoke detection is only needed in areas served by air-handling equipment. The intent of the requirement is to detect smoke being introduced into the space and shut down air handing equipment serving the space.

17.6.3.5.2

~~17.6.3.5.2* The minimum spacing of heat detectors shall not be required to be less than 0.4 times the height of the ceiling.~~

Justification: The intent of this amendment is to remove the lower limit of heat detector spacing that is provided by NFPA 72 Table 17.6.3.5.1. Please note that this analysis is not justification for the Table 17.6.3.5.1, but only an argument to remove the lower limit heat detector spacing of 0.4 times the ceiling height. From *Design of Smoke Management Systems*, Klote and Milke, equations 10.18 through 10.21, there is an evaluation of the plume temperature with respect to the ceiling height and with respect to distance from plume centerline. As can be seen from equation 10.21, the **VISIBLE** diameter of the plume is approximately half of the ceiling height. Annex B of NFPA 72, Section B.4.9.1, provides a slightly more conservative figure for the **VISIBLE** plume diameter to be approximately 0.4 times the ceiling height. However, Annex B.4.9.1 discusses spacing of beam detectors, not spacing of heat detectors. The analysis may be appropriate for smoke-sensing devices, but breaks down for heat-sensing devices. As can be seen from comparing equations 10.18 and 10.20 from Klote/Milke, the **EXCESS TEMPERATURE** plume diameter is exactly half of the **VISIBLE** diameter. The **EXCESS TEMPERATURE** is defined to be the point in the plume where the smoke temperature is one-half of the plume centerline temperature. The annex to 17.6.3.5.2 indicates that the factor of 0.4 is chosen because "the width of uniform temperature of the plume when it impinges the ceiling is approximately 0.4 times the height above the fire". This does not coincide with the information provided by Klote/Milke, which indicates a decay of plume temperature away from the plume centerline. Following the Klote/Milke information would yield a lower limit of 0.25 ceiling height. Since this is less than the smallest factor from Table 17.6.3.5.1, no lower limit is necessary. Therefore, since there is a question as to the adequacy of the 0.4 factor used in Section 17.6.3.5.2, this section is deleted.

17.7.3.1.3

17.7.3.1.3 If the intent is to protect against a specific hazard, and the detectors are not otherwise required by this code or other applicable codes, the detector(s) shall be permitted to be installed closer to the hazard in a position where the detector can intercept the smoke.

Justification: The intent is to limit the use of 17.7.3.1.3 only to situations where an owner/user is adding detectors for protection of a certain piece of equipment. The language of 17.7.3.1.3 seems to imply that smoke detectors must be allowed to be installed outside of its listings and other code requirements for all situations, so long as the argument is made that the detector is closer to a specified hazard. There is nothing in the rest of NFPA 72 that prohibits placing a required smoke detector close to the hazard, but such installation is required to comply with listing and spacing requirements. For instance, for areas with tall ceilings, past practice in various parts of the country has allowed for the installation of the smoke detector on the wall, more than 12 inches from the ceiling, just above the "hazard" being protected. This has been used for elevator lobby recall in tall lobbies, and for protection of the fire alarm control panel. It both cases, the smoke detector placed on the wall ignores the effects of a fire that can be close to the "hazard", and still not be close enough to have the plume impinge on the wall. Waiting for the smoke to fill the room, and bank down to wherever the smoke detector is installed, delays the response time of the detector, and could lead to the elevator opening onto a floor area with a developed fire. It is imperative to limit this code section only to non-required installations in order to ensure that base code forces required smoke detectors to be placed on or near the ceiling.

17.12.2

17.12.2* Activation of the initiating device shall occur ~~90~~ between 15 to 60 seconds of waterflow at the alarm-initiating device when flow occurs that is equal or greater than that from a single sprinkler of the smallest orifice size installed in the system.

Justification: To coordinate with a proposed sprinkler code amendment.

18.3.2.4

18.3.2.4 Voltage drop calculations shall be performed using one of the following methods:

(1) The lump sum calculation method, which shall be calculated as follows:
  (a) Calculate the voltage drop using one of these formulas:
    i. $V_D = I * ((R * 2 * L)/1{,}000)$ **OR**
    ii. $V_D = (2 * K * I * L)/CM$.
  (b) Subtract this calculated voltage drop from 20.4 volts (V_S) in order to get the voltage value at the end of the circuit ($V_S - V_D = V_{EOL}$). The value for V_{EOL} shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

(2) The point-to point method, which requires a math-intensive approach where the voltage drop between each notification appliance is reiterated. This method is best done by utilizing a spreadsheet program. The calculated voltage at the last device on the circuit shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

Where:

V_D = Voltage Drop

V_S = Starting voltage (20.4vdc, or the end of useful battery life)

V_{EOL} = Voltage at the end-of-line resistor

I =Total load of the circuit in amperes utilizing current draws for each notification appliance @ 16vdc (the UL maximum draws at the minimum listed voltage).

R = Resistance in ohms per 1,000 feet, with respect to conductor

K = 10.64 ohms (the constant representing the mil-foot resistance of copper wire)

L = length of circuit in feet (distance from panel to end-of-line resistor for class B circuits)

CM = circular mill of wire, with respect to conductor.

V_{SOURCE} = voltage calculated at the previous device

Wire	R	CM
No 18	7.95	1,620
No 16	4.99	2,580

No 14	3.14	4,110
No 12	1.98	6.530

Justification: This amendment is intended to standardize the way in which designers calculate voltage drops for notification circuits. The methods shown on this proposal in calculating voltage drops are consistent with the methods described in the narrative of the NFPA 72 Fire Alarm Code Handbook. The base code for NFPA 72 does not provide guidance with regards to the methods to use when calculating voltage drops.

18.4.1.4

18.4.1.4 Audible notification appliances for alert and evacuation signal tones shall meet the requirements of 18.4.1.5. ~~18.4.3 (Public Mode Audible Requirements), 18.4.4 (Private Mode Audible Requirements), 18.4.5 (Sleeping Area Requirements), or 18.4.6 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), as applicable.~~

Note: Sections 18.4.1.4.1 through 18.4.1.4.5 remain unchanged.

Justification: IFC Section 907.5.2.1.1 specifies the requirements of NRS for the local audible notification requirements for minimum 80dB sound pressure.

18.4.1.5

18.4.1.5 The tone portion of ~~v~~Voice messages shall ~~not~~ be required to meet the audibility requirements of IFC 907.5.2.1.1. ~~18.4.3 (Public Mode Audible Requirements), 18.4.4 (Private Mode Audible Requirements), 18.4.5 (Sleeping Area Requirements), or 18.4.6 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), but~~ The voice portion of voice messages shall meet the intelligibility requirements of 18.4.10 where voice intelligibility is required.

Justification: IFC Section 907.5.2.1.1 specifies the requirements of NRS for the local audible notification requirements for minimum 80dB sound pressure. The base code now allows that voice messages do not have to comply with minimum sound levels as long as the voice intelligibility as adequate. To be consistent in enforcing the proposed minimum 80 decibel requirement, this code section should be revised. It shouldn't matter whether the system is a voice evacuation system or a 24 vdc temporal 3 evacuation system. It should still have to meet the minimum 80 decibel requirement for the tone portion.

18.4.1.7

18.4.1.7 Critical care areas of health care facilities shall be allowed to have visible notification appliances in lieu of audible notification appliances when approved by the authority having jurisdiction.

Justification: IFC 907.5.2.1.1.1 allows for this exception.

18.4.2.4

18.4.2.4 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.*

Justification: Given the large spaces regularly remodeled within the Las Vegas Valley, this requirement could be extremely costly and detrimental to commercial remodels. The fire code committee has developed the exception to meet the intent of the standard and maintain the feasibility of commercial remodels throughout the Las Vegas Valley.

18.5.5.4.2

18.5.5.4.2 Visible notification appliances shall be installed in accordance with Table 18.5.5.4.1(a) or Table 18.5.5.4.1(b) using one of the following:

(1) A single visible notification appliance
(2)*Two groups of visible notification appliances, where visual appliances of each group are synchronized, in the same room or adjacent space within the field of view. This shall include synchronization of strobes operated by separate systems
(3) More than two visible notification appliances or groups of synchronized appliances in the same room or adjacent space within the field of view that flash in synchronization

> *Exception: Where a portion of a room or space is remodeled and new or existing strobes are within the area of the remodel, such strobes are required to synchronize with each other, but are not required to synchronize with existing strobes in the field of view if the existing strobes are outside of the remodel area and were installed prior to the adoption of the 1996, or later, edition of NFPA 72.*

Justification: The purpose of this amendment is to clarify what strobes are required to be synchronized when a remodel project occurs. When a remodel project occurs within a space where existing strobes are not

synchronized, it is difficult to determine what strobes need to be synchronized. This amendment clarifies that all strobes in the remodel area (whether new or existing devices) must meet the requirements of the current code. However, other strobes that might be in the field of view, but are clearly outside of the remodel area, would be allowed to continue operation as was permitted at the time of construction. Note that if the existing strobes were installed after adoption of the 1996, or subsequent, edition of NFPA 72, the existing strobes do have to be synchronized with the strobes in the remodel area

18.5.5.6.2

18.5.5.6.2 Documentation provided to the authority having jurisdiction shall be stamped by a licensed engineer and shall include the following:

(1) Inverse Square Law calculations using each of the vertical and horizontal polar distribution angles in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.
(2) The calculations shall account for the effects of polar distribution using one of the following:
    a. The percentages from the applicable table(s) in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.
    b. The actual results of laboratory tests of the specific appliance to be used as recorded by the listing organization.

Justification: Since this is considered a "performance-based alternative" that involves detailed calculations, then it is appropriate to have a licensed engineer provide the required documentation.

18.5.5.8

18.5.5.8 Ceiling-mounted visual appliances shall be provided in rooms and areas used for exhibition purposes, or in rooms and areas where racks or shelving that exceed 5 feet in height are expected to be installed, or in rooms and areas where wall-mounted devices may become obstructed..

Justification: The base code does not address this specific issue. At issue is that the uses that come with exhibition spaces and uses with racks or shelving often cause disruption of visual appliances when such appliances are mounted on the wall.

Many exhibition facilities have had to install temporary devices to address severe obstructions, and others have added ceiling–mounted visual devices in rooms that are already provided with wall-mounted devices to address the issue. Enforcement to correct these issues in all occasions is not adequate. The intent of this amendment is to force ceiling-mounted devices in exhibition areas that would have obstructions of devices during the normal course of the space being used. The term "exhibition" is not defined, but is intended to address large rooms, such as found in the Las Vegas Convention Center, Cashman Center, Sands Expo, Mandalay Bay Expo Center, etc.

The fire alarm requirements for facilities such as warehouse superstores and other uses with racks or shelving is relatively new, and the issue of visual notification challenges presented by these types of uses is not currently addressed in the base code, although is indirectly addressed in the annex. It has been observed that wall-mounted

visual appliances are typically obstructed by the racks or shelving, and wall-mounted appliances are more apt to be subject to mechanical damage caused by forklifts or stock. This amendment attempts to mitigate these issues.

21.3.5

21.3.5* A lobby smoke detector shall be located on the ceiling within 21 ft (6.4 m) of the centerline of each elevator door within the elevator bank under control of the detector.

~~*Exception: For lobby ceiling configurations exceeding 15 ft (4.6 m) in height or that are other than flat and smooth, detector locations shall be determined in accordance with Chapter 17.*~~

Justification: The base code seems to indicate that there is some other method of smoke detector installation when the height of a ceiling exceeds 15 feet, which would exempt the detector from being placed in accordance with 21.3.5. Chapter 17 does cover the method of smoke detector installation for detectors. Section 17.7.3.1.3 (which is proposed for deletion in a companion amendment) would seem to allow for the smoke detector to be installed in a place other than on the ceiling. There is no justification for the 15 feet height determination, and further the code does not ensure that designs utilizing the exception would have the device located in a better location. In all areas of fire protection, devices are located on or near the ceiling. These include heat detectors, smoke detectors, and fire sprinklers. Issues with stratification do exist, but these are normally discussed with truly tall ceiling heights, such as those that exceed 50 feet high. Since the exception does not have technical basis, and could allow for a lesser level of protection, it is proposed that the exception be deleted.

21.7.2

21.7.2* If connected to the fire alarm system serving the protected premises, all detection devices used to cause the operation of HVAC systems smoke dampers, fire dampers, fan control, smoke doors, and fire doors shall be monitored for integrity in accordance with Section 10.6.9 and Section 12.6. <u>Duct detectors connected to fire alarm systems shall be 24 vdc system-type detectors that are powered by the fire alarm system.</u>

> <u>*Exception:* When duct detectors are installed in locations such as rooftops or other similar areas where extreme temperatures are to be expected, 120 vac duct detectors that are listed for the expected temperatures may be allowed to be installed when approved by the code official, as long as the duct detectors are capable of generating a trouble signal to the FACU if the power is lost, and is capable of generating a supervisory signal to the FACU when the duct detector is activated.</u>

Justification: This amendment is to clarify that system-type 24 vdc duct detectors are required to be installed when a building has a fire alarm system. Currently, there are numerous duct detectors installed throughout the valley that are not being powered by FACU's. Therefore, when power is turned off to the HVAC unit(s), a trouble condition is reported to the FACU. When the duct detectors are powered by the FACU, they will not produce a trouble condition to the FACU when power to the unit is turned off. This amendment will help decrease the amount of troubles that are being sent to the FACU when power is turned off to the HVAC units. This problem has been occurring more frequently since the beginning of the economic downturn. This amendment also increases the chances that the wiring is being properly monitored for integrity as is required by Section 12.6 from NFPA 72.

This amendment also provides an exception to utilizing 24 vdc system-type detectors as long as a few requirements are met. Duct detectors that are installed by mechanical contractors are typically rated for the temperatures

present on the roof top. Note that many system detectors are not listed for the expected temperatures and cannot take the heat during the summer. This is the main reason to include the exception.

23.2.2.4

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

Justification: This amendment is intended to clarify to contractors as to when a permit will need to be pulled when modifying site-specific software.

23.8.5.1.2

23.8.5.1.2* Where connected to a supervising station, fire alarm systems employing automatic fire detectors or waterflow detection devices shall include a manual fire alarm box to initiate a signal to the supervising station. The fire alarm box shall be located adjacent to the fire alarm control unit.

> **Exception:** Fire alarm systems dedicated to elevator recall control and supervisory service as permitted in Section 21.3 or fire sprinkler monitoring systems.

Justification: The language will clarify the location for the device to be installed.

23.8.5.9.1

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 ~~permitted to be~~ a supervisory ~~or alarm~~ signal.

Justification: This amendment is made to clarify the requirement for monitoring of the fire pump run signal. NFPA 72 has permissive language that does not provide clear direction as to what type of signal is required. The intent of this amendment is to make all of the fire pump signals supervisory. The assumption is that a fire pump run signal will follow a waterflow switch signal, and since the water flow switch is required to transmit an alarm signal, the monitoring station will be notified of an alarm. Adding the second alarm from the fire pump can be confusing to responders, and is not necessary to initiate response. Most fire pumps in this jurisdiction are designed to have the fire pump run signal as a supervisory signal, so this amendment will not change common current practice

23.8.5.9.3

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.

Justification: Fire pumps are a critical piece of any fire protection system. It's very important to immediately know when fire pumps are running, whether it has operational problems, or when the associated valves are not in their normal positions. The base code of NFPA 20 only requires that the signals be sent to a normally occupied location. Although most facilities meet this code requirement by having the fire alarm system monitor the signals, not all of them do. In reality, sometimes the fire pump annunciator isn't always located in a normally occupied location, even though that is what code requires. This sometimes gets missed both during plan reviews and inspections. This code proposal will mitigate that problem. Another bonus would be that the signals will also be sent to an off-site monitoring facility in many cases.

23.8.5.9.4

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.

Justification: Fire pumps are a critical piece of any fire protection system. It's very important to immediately know when fire pumps are running, whether it has operational problems, or when the associated valves are not in their normal positions. The base code of NFPA 20 only requires that the signals be sent to a normally occupied location. Although most facilities meet this code requirement by having the sprinkler monitoring system monitor the signals, not all of them do. In reality, sometimes the fire pump annunciator isn't always located in a normally occupied location, even though that is what code requires. This sometimes gets missed both during plan reviews and inspections. This code proposal will mitigate that problem. Another bonus would be that the signals will also be sent to an off-site monitoring facility in many cases.

23.8.6.2

23.8.6.2* Notification Appliances in Exit Stair Enclosures, Exit Passageways, and Elevator Cars. In buildings required to be provided with emergency voice/alarm communications systems ~~N~~notification appliances shall ~~not~~ be required in exit stair enclosures, exit passageways, and elevator cars in accordance with 23.8.6.2.1 through 23.8.6.2.4.

Justification: The base code seems to indicate that there is allowance for not having devices in exit enclosures, exit passageway, and elevator cars. However, there are instances where devices are required in these areas, and the subsections to this code have several of those instances. In order to eliminate confusion about whether alarm devices are required in these areas, this change is necessary.

23.8.6.2.3

23.8.6.2.3 The evacuation signal shall not be required to automatically operate in exit stair enclosures and exit passageways. Manually activated speakers shall be provided in exit stair enclosures and exit passageways in buildings required to have Emergency Voice/Alarm Communication systems in accordance with Section 24.4.

Justification: The base code allows for elimination of alarms in stairs and passageways. It is unclear from the base NFPA 72 code whether any audible devices are required in these areas. However, the IBC and IFC require alarms in these areas. The intent of this amendment is to clearly indicate that manually activated speakers shall be required where the building is served by a voice alarm system. Voice alarm systems are required in large facilities in case specific instructions need to be relayed to building occupants. There are an unlimited number of scenarios that can be imagined that would necessitate live voice instructions to occupants in these areas. It is important to have this capability for live messaging to all areas of a building, including exit stairs and exit passageways.

23.8.6.2.4

23.8.6.2.4 The evacuation signal shall not be required to automatically operate in elevator cars. Manually activated speakers shall be provided in elevator cars in buildings required to have Emergency Voice/Alarm Communication systems in accordance with Section 24.4.

Justification: The base code allows for elimination of alarms in elevator cars. It is unclear from the base NFPA 72 code whether any audible devices are required in these areas. However, the IBC and IFC require alarms in these areas. The intent of this amendment is to clearly indicate that manually activated speakers shall be required where the building is served by a voice alarm system. Voice alarm systems are required in large facilities in case specific instructions need to be relayed to building occupants. There are an unlimited number of scenarios that can be imagined that would necessitate live voice instructions to occupants in these areas. It is important to have this capability for live messaging to all areas of a building, including elevator cars.

23.8.6.3.2

23.8.6.3.2 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. ~~building fire or smoke compartment boundaries, floor separations, or other fire safety subdivisions.~~ 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.

Justification: The purpose of this amendment is to limit the types of separations that can be used to create separate fire alarm zones. For small buildings, it is anticipated that the entire building will evacuate simultaneously. For large buildings, due to the number of occupants, designers often choose to evacuate only a portion of the building. This amendment intends to define what the construction separation requirements need to be for the walls and floors separating notification zones. The base code seems to imply that any barrier that is a fire safety barrier can be used to define a separate notification zone, and seems to indicate that separate notification zones can alarm separately. It is not appropriate to allow separate alarms for all types of separate fire safety barriers. The amendment is made to require fire walls or fire barriers to separate notification zones. A companion amendment is made to Section 24.4.9.4.

23.8.6.5

23.8.6.5 Emergency Voice/Alarm Communication Notification Appliance Circuits. Emergency voice/alarm communication notification appliance circuits shall be capable of full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) as determined in accordance with Sections 23.8.6.5.1, 23.8.6.5.2 or 23.8.6.5.3.

23.8.6.51 Power Loss Calculations. A calculation for each circuit shall be provided to the authority having jurisdiction demonstrating simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB). Power loss calculations similar to the following shall be used:

PLoss = 10 * Log [1 - ((2 * RL) / (2 * RL + (VLine squared / PRated))]

RL = (RRef / 1000) * D

With variables defined as follows:

D = length of wire used (in feet)
PLoss = power loss (in dB)
PRated = power driven on line from the amplifier (in watts)
RL = wire gauge resistance (in ohms)
RRef = wire resistance based on gauge of wire used (in ohms/ft.)
VLine = voltage on line (typically 25 volts or 70 volts)

Alternatively the distance may be calculated using a calculation similar to:

D = (61 / RRef) * (VLine squared / PRated)

23.8.6.5.2 Power Loss Tables. To ensure circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB), wiring shall be limited to the distance allowed in Tables 23.8.6.5.2.a and 23.8.6.5.2.b.

Table 23.8.6.5.2.a, 25 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	12	19	31	49	79
150	16	26	41	66	105
100	25	39	62	99	158
75	33	52	83	132	210
60	41	65	104	165	263
50	49	78	124	198	315
40	61	97	155	247	394
30	82	130	207	329	525
25	98	156	248	395	630

Table 23.8.6.5.2.b, 70 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	98	156	248	395	630
150	131	208	331	527	840
100	196	312	497	790	1260
75	262	416	662	1053	1680
60	327	520	828	1317	2100
50	392	624	993	1580	2520
40	491	780	1242	1975	3150
30	654	1039	1656	2633	4200
25	785	1247	1987	3160	5041

*Cable Ohms is expressed in ohms per 1000 feet (2008 NEC Ch.9 Table 8, uncoated, single strand copper)
The length represented accounts for both wires in the circuit.

23.8.6.5.3 Manufacturers Power Loss Calculator. When allowed by the authority having jurisdiction manufacturers calculations showing circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) are acceptable.

Justification: This amendment was created to provide prescriptive requirements for calculating power loss due to wiring in emergency voice alarm communication systems. The three methods are provided for achieving a result. This amendment was also requested by industry representatives

24.4.2.9.4

24.4.2.9.4 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over the notification zone boundary. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

Justification: The purpose of this amendment is to define the types of separations that can be used to create separate fire alarm zones. For small buildings, it is anticipated that the entire building will evacuate simultaneously. For large buildings, due to the number of occupants, designers often choose to evacuate only a portion of the building. This amendment intends to define what the construction separation requirements need to be for the walls and floors separating notification zones. The base code seems to imply that any barrier that is a fire safety barrier can be used to define a separate notification zone, and seems to indicate that separate notification zones can alarm separately. It is not appropriate to allow separate alarms for all types of separate fire

safety barriers. The amendment is made to require fire walls and fire barriers to separate notification zones. A companion amendment is made to Section 23.8.6.3.2.

26.4.7.1.1

26.4.7.1.1 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 fire alarm signals
5. the cause and disposition of fire alarm signals

Justification: This is to provide the fire departments and companies maintaining the systems to have documentation that can be utilized to determine if the fire alarm signals are being properly logged and properly mitigated. This may also help mitigate the causes of false activations

26.6.3.1.7.1

26.6.3.1.7.1 Internet Protocol Technology

When utilizing network interface (Internet Protocol) signal transmission equipment, the supervising station shall regularly communicate (poll) with the transmitter at least once every 75 seconds and be allowed 15 seconds for the acknowledgment of such signals. Retry shall be 3 seconds between each communications attempt. A Secondary transmission means shall be provided per Section 26.6.3.2.1.4. The use of VOIP technology is not permitted.

Justification: The use of IP (internet protocol) communications is becoming the preferred method for central station communications not only in the Las Vegas Valley but across the country. Currently the communication integrity requirements for such IP systems are not clearly identified in NFPA 72. There is equipment currently on the market that meets or exceeds the above requirement.

The current installation practice today is the installation of non UL 864 fire alarm listed VOIP device at the protected premises connected to the fire alarm DACT system and then subsequently connected to the central or supervising station. This practice does not meet the requirements of Chapter 26.

Regarding current communications integrity testing requirements, the DACT connected to the central station is only required to transmit a test signal every 24 hours based on NFPA 72 when utilizing the public phone system. The 75 second IP test poll time is based on current IP technology.

29.8.2.2

29.8.2.2* The interconnection of smoke or heat alarms shall comply with the following:

(1) Smoke or heat alarms shall not be interconnected in numbers that exceed the manufacturer's published instructions.

(2) In no case shall more than 18 initiating devices be interconnected (of which 12 can be smoke alarms) where the interconnecting means is not supervised.
(3) In no case shall more than 64 initiating devices be interconnected (of which 42 can be smoke alarms) where the interconnecting means is supervised.
(4) Smoke or heat alarms shall not be interconnected with alarms from other manufacturers unless listed as being compatible with the specific model.
(5) When alarms of different types are interconnected, all interconnected alarms shall produce the appropriate audible response for the phenomena being detected or remain silent.
(6) For applications that require supervision, a listed control unit shall be installed.

Justification: The newly added section is right out of the commentary text of the handbook. This is a code clarification as far as what will be required once you exceed the 12 smoke alarm threshold.

NFPA 86

6.3.4.1(A)

6.3.4.1(A) Manual Shutoff Valves.

(A) Individual manual shutoff valves for equipment isolation shall be provided for shutoff of the fuel to each piece of equipment. Valves for fuel supply lines shall be located within 6 feet (1829 mm) of the appliance served.

Exception: When approved and the valve is located in the same general area as the appliance served.

Justification: This amendment is in order to correlate requirements with the IFC Section 3004.2.1.

NFPA 160

5.5.1(3)

5.5.1(3) An approved fire watch according to IFC Section 901.7 ~~capable of directing the operation of all fire protection and life safety systems installed in the building is present~~.

Justification: The fire watch should be conducted according to the IFC. The NFPA 160 criteria are too vague.

7.1.6

7.1.6 The separation distance between the flame effect and the audience shall be such that the incident thermal radiation received does not exceed that calculated by the following equation:

$T = [35 / q]^{1.33}$

Where:

T= time in seconds

q = incident thermal flux in kW/ m^2

The value of q can also be taken from Figure A7.1 of NFPA 160.

When applying the preceding equation to an effect with a duration of 4 seconds or less, the time used in calculating the maximum acceptable level if incident thermal flux shall correspond to the root mean squared (RMS) value of the peak incident thermal flux.

The incident radiation should not cause the surface temperature of the exposed skin of a member of the audience to exceed 111° F (44.0) °C. Incident radiation shall be measured with a radiometer, Skin temperature may also be measured with an infrared surface temperature thermometer or other equivalent means.

Justification: A method of determining the separation distance between the flame effect and the audience is instituted by this amendment. This method is currently used by the CCFD and is taken from the Annex. It is Annex Section A7.1 of NFPA 160. Since this equation and method is currently in use, the committee recommends that it be included as an amendment to ensure that the preferred method is used.

8.1.3

8.1.3 The operator shall be licensed in accordance with NRS 477 and NAC 477.

Justification: The new language is proposed for consistency with the CCFD Flame Effects Guideline and codification of the Nevada State Fire Marshal Regulations.

NFPA 385

9.2.3

9.2.3 ~~During transfer of Class I liquids,~~ ~~m~~Motors of tank vehicles or motors of auxiliary or portable pumps shall be shut down during the making and breaking of hose connections.

Justification: IFC Section 5706.6.1.3, which is a similar code requirement, doesn't state that the code section only applies to Class I liquids.

9.2.3.1

9.2.3.1 Where loading or unloading is done without requiring the use of the motor of the tank vehicle, the motor shall be shut down throughout the transfer operations. ~~of Class I liquids.~~

Justification: IFC Section 5706.6.1.3, which is a similar code requirement, doesn't state that the code section only applies to Class I liquids.

9.3.3

9.3.3 Fire extinguishers shall be kept in good operating condition at all times and shall be located in an accessible place on each tank vehicle. During unloading of the tank vehicle, the portable fire extinguisher shall be out of the carrying device on the vehicle and shall be 15 feet (4572 mm) or more from the unloading valves.

Justification: This requirement comes from the IFC Section 5706.6.4. This amendment attempts to correlate the two sections.

NFPA 407

5.3.4

5.3.4 Emergency fuel shutoff systems shall be operationally checked at intervals not exceeding ~~6~~ 3 months. Each individual device shall be checked at least once during every 12-month period.

Justification: This amendment is an attempt to correlate code requirements found in the IFC Section 2006.6.4

5.10.1

5.10.1 Aircraft fuel servicing (also called aircraft fuel-transfer operations) shall be performed outdoors. Aircraft fuel servicing incidental to aircraft fuel system maintenance operations shall comply with the requirements of NFPA 410.

> **Exception:** In aircraft hangers built in accordance with the provisions of the International Building Code for Group F-1 occupancies, aircraft fuel transfer operations are allowed where:
>
> 1. Necessary to accomplish aircraft fuel-system maintenance operations. Such operations shall be performed in accordance with nationally recognized standards; or
> 2. The fuel being used has a flash point greater than 100 degrees F.

Justification: This amendment is an attempt to correlate code requirements found in the IFC Section 2006.17.

5.12.3

5.12.3 Parking brakes shall be set on all fuel servicing vehicles or carts before operators begin the fueling operations. At least two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be utilized and positioned in such a manner as to preclude movement of the vehicle in any direction.

Justification: This amendment is an attempt to correlate code requirements found in the IFC Section 2006.5.1.3.

5.13.4

5.13.4 Where the open-hose discharge capacity of the fueling system is not more than 200 gallons per minute, a minimum of two listed portable fire extinguishers having a minimum rating of 20-B:C shall be provided. Where the open hose discharge capacity of the aircraft fueling system or equipment is more than 200 gpm ~~(750 L/min)~~ but not more than 350 gallons per minute, at least one listed wheeled extinguisher having a rating of not less than 80-B:C and a minimum capacity of 125 lb ~~(55 kg)~~ of agent shall be provided. Where the open hose discharge capacity of the fueling system is more than 350 gallons per minute, a minimum of two listed wheeled extinguishers having a minimum rating of 80 B:C each and a minimum capacity of 125 lb of agent shall be provided.

Justification: This amendment is an attempt to correlate code requirements found in the IFC Section 2005.6.

NFPA 1126

8.1.6.1

8.1.6.1 Portions of fire detection ~~and life safety~~ systems specific and limited to the pyrotechnic effects shall be permitted to be ~~interrupted,~~ bypassed, only as required to prevent a nuisance alarm during the operation of ~~temporarily installed~~ pyrotechnic effects when the following conditions are met:

(1) Approval of the authority having jurisdiction and as defined on the permit application.
(2) Approval by the owner, venue operator ~~owner's~~ or their agents.
(3) Presence of an approved fire watch capable of directing the operation of all fire detection and life safety systems installed in the building.
(4) Waterflow switches and fire alarm notification systems shall not be permitted to be disabled or bypassed.
(5) System bypass shall only be performed by a licensed fire alarm contractor or an owner's representative as approved by the authority having jurisdiction.

Justification: It is reasonable to allow disabling of fire detection devices that will detect smoke and flame produced by the indoor pyrotechnics and thus avoid nuisance alarm and unwanted evacuations. Areas not likely to be affected by the pyrotechnics should remain active. This proposal is to prevent the disabling of the fire alarm and detection features in areas that should remain active. Also, the permit application information is to include a justification for the locations to be without detection and the equipment should be disabled only as necessary for the performance duration using pyrotechnics.

The owner and venue operator may not be the same entity. Revision to item 2 is to ensure that a responsible party has approved and has knowledge of the pyrotechnics.

Temporarily installed is deleted because there are permanently installed pyrotechnics in this jurisdiction that need to comply with this section.

Qualified individuals shall only be allowed to bypass fire alarm system functions to ensure that systems not associated with the pyrotechnics area are not affected.

8.1.6.3

8.1.6.3 Indoor pyrotechnic displays shall only be permitted in venues provided with automatic sprinklers throughout.

Justification: Automatic sprinkler systems are typically installed in venues that are likely to use indoor pyrotechnics. This Section makes the sprinkler protection, as well as enhancements given in the amended International Fire Code mandatory. These enhancements will include increased areas of application and larger sprinkler orifices for sprinklers in high ceiling venues. The increased hazard of ignitions due to indoor pyrotechnic displays warrants ensuring that sprinkler protection is provided.

NFPA 2001

5.1.1

5.1.1 Specifications. Specifications for total flooding and local application clean agent fire extinguishing systems shall be prepared under the supervision of a person fully experienced and qualified in the design of such systems and with the advice of the AHJ. Starting on January 1, 2012, plans for clean agent extinguishing system installations shall have a wet signature of a minimum NICET Level II designer for Special Hazards Suppression Systems. The specifications shall include all pertinent items necessary for the proper design of the system, such as the designation of the AHJ, variances from the standard to be permitted by the AHJ, design criteria, system sequence of operations, the type and extend of the approval testing to be performed after the installation of the system, and owner training requirements.

Justification: Clean agent systems incorporate elements from both fire alarm and suppression systems. We require a minimum NICET II Level designer to sign both fire alarm and suppression systems. It only makes sense to place these same requirements for designers of clean agent systems. These systems typically require hydraulic calculations, voltage drop calculations & battery calculations, among other things. The designing of these systems can often be complicated, and so it's very important that an experienced and qualified person review and sign these plans before submitting.

5.1.2.2 (23)

5.1.2.2(23) Complete step-by-step description of the system sequence of operations, including, but not limited to, the operation of all applicable initiating devices, the operation of audible and visual pre-discharge and post-discharge alarms, functioning of abort and maintenance switches, delay timers, and emergency power shutdown.

Justification: Some submittals don't contain information regarding the pre- and post-discharge audible and visual signals, among other things. This amendment clarifies that the newly added information is required to be supplied within the sequence of operations section of a submittal.

5.1.2.2 (28)

5.1.2.2(28) Pressure relief vent area, or equivalent leakage area, for the protected enclosure to prevent development, during system discharge, of pressure difference across the enclosure boundaries that exceeds a specified enclosure pressure limit. For clean agent systems that utilize inert gases as the extinguishing agent, an analysis prepared by a licensed engineer that provide vent area calculations shall be submitted and approved.

Justification: Clean agent extinguishing systems that utilize inert gases as the extinguishing agent produce a lot of pressure inside of an enclosure that could potentially significantly damage the enclosure if not properly vented. If the integrity of the enclosure is compromised, then the extinguishing agent may not be able to extinguish the fire due to some of the agent escaping from the enclosure. Damage could also be done to the sprinkler system serving the enclosure itself, and possibly damaging the sprinkler system that is adjacent to the enclosure. There have been real-life events that have occurred where the agent had discharged and had caused significant structural damage to the enclosure due to over-pressurization.

5.3.7

5.3.7 The protected enclosure shall have the structural strength and integrity necessary to contain the agent discharge. If the developed pressures present a threat to the structural strength of the enclosure, venting shall be provided to prevent excessive pressures. Designers shall consult system manufacturer's recommended procedures relative to enclosure venting. [For pressure relief vent area or equivalent leakage area, see 5.1.2.2(28)]. For clean agent systems that utilize inert gases as the extinguishing agent, a licensed engineer shall provide a report which includes the pressure relief vent area calculations and includes the design of the overall ventilation system serving the enclosure(s) in order to ensure that the ventilation system will prevent over-pressurization and potential structural damage to the enclosure(s).

Justification: Clean agent extinguishing systems that utilize inert gases as the extinguishing agent produce a lot of pressure inside of an enclosure that could potentially significantly damage the enclosure if not properly vented. If the integrity of the enclosure is compromised, then the extinguishing agent may not be able to extinguish the fire due to some of the agent escaping from the enclosure. Damage could also be done to the sprinkler system serving the enclosure itself, and possibly damaging the sprinkler system that is adjacent to the enclosure. There have been real-life events that have occurred where the agent had discharged and had caused significant structural damage to the enclosure due to over-pressurization.