

Southern Nevada Consensus Fire Code Amendments

Adapted to 2018 IFC including various NFPA Standards

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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 O – Proprietary (self) monitoring, as amended

Appendix P – 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.

SNBO Justification: This amendment is required to clarify the intent of the codes.

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.

IMC-18 International Mechanical Code is replaced with 2018 Uniform Mechanical Code

IPC-18 International Plumbing Code is replaced with 2018 Uniform Plumbing Code

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

SNBO Justification: Amendment required to provide for consistency in regional interpretation and application of the codes.

104.12

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

Justification: The purpose of this amendment is to identify the requirements for Fire Protection Reports.

SNBO Justification: This amendment is required to clarify the requirements for Fire Protection Reports.

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

Justification: The purpose of this amendment is to identify the requirements for Building Fire Protection Reports.

SNBO Justification: This amendment is required to clarify the requirements for Building Fire Protection Reports.

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

1. The area of remodel occurs over a floor area exceeding 20,000 square feet.
2. The area of remodel is an assembly occupancy with an occupant load that exceeds 1,000 persons.
3. The area of remodel occurs within spaces dedicated to or affecting emergency personnel response areas, such as exit enclosures, elevators, elevator lobbies, fire command centers, secondary response points, fire riser rooms, and fire pump rooms.
4. The tenant improvement space is not intended to install a sprinkler isolation control valve
5. The remodel area requires specific engineered fire suppression and/or alarm systems that will require an alternate means of system design that is not supported by adopted NFPA codes.
6. The remodel area includes clean agent suppression systems, new or existing.
7. The remodel includes kitchen exhaust systems that are used for smoke control or smoke removal and thereby requiring coordination of exhaust fan functioning.
8. The remodel area contains hazardous materials storage and/or use areas in any amount.
9. The remodel area includes high-piled storage.
10. The remodel area includes access controlled egress doors, delayed egress door hardware or other hardware systems that are interconnected with fire protection systems.
11. The remodel area modifies an existing smoke control system, smoke removal system, smoke control boundary or smoke removal boundary and the fire code official requires submittal of a remodel FPR.
12. Fire 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.

Justification: The purpose of this amendment is to identify the requirements for T.I. and Remodel Fire Protection Reports.

SNBO Justification: This amendment is required to clarify the requirements for T.I. and Remodel Fire Protection Reports.

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

1. All instances where active fire protection features are offered as a mitigation in support of an alternative solution.
2. All requests relating to or referencing the International Fire Code or NFPA codes adopted within the International Fire Code.
3. All requests that involve alternate installation requirements of any active fire protection system governed by either the International Fire Code or Chapter 9 of the International Building Code, such as: automatic sprinkler 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.

Justification: The purpose of this amendment is to identify the requirements for Alternative Materials and Methods Reports.

SNBO Justification: This amendment is required to clarify the requirements for Alternative Materials and Methods Reports.

104.12.4 Temporary Certificate of Occupancy (TCO) Fire Protection Report. When a temporary certificate of occupancy (TCO) is requested in a building that required a fire protection report prior to construction, the fire code

official is authorized to require a fire protection report describing the uses to be occupied, the completed construction features, and the status of life safety systems, be submitted and approved prior to approval of the TCO request.

Justification: The purpose of this amendment is to identify the requirements for TCO Fire Protection Reports.

SNBO Justification: This amendment is required to clarify the requirements for TCO Fire Protection Reports.

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

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

SNBO justification: Amendments required to clarify the intent of the codes.

105.1.7

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

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

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

The following information shall be provided on the certificate:

1. The contractor shall be named as the insured. If the insurance is provided by an individual, company or partnership other than the contractor, the contractor shall be named as an additional insured.
2. "insert name of jurisdiction it's agents, employees and volunteers" shall be named as both an additional insured and certificate holder
3. General liability limits, including contractual liability, in the minimum amounts specified below of the specific operation being conducted:
 - a. To erect temporary membrane structures, tents, or canopies. See Chapter 31 \$2,000,000.
 - b. To store or use explosive materials or pyrotechnic displays. See Chapter 56: \$5,000,000

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

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

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

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.

SNBO Justification: Amendments required to clarify requirements for certificates of insurance.

Table 105.6.8

Table 105.6.8
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NPT)
Carbon dioxide used in carbon dioxide enrichment systems	875 (100 lbs.)
Carbon dioxide used in insulated liquid carbon dioxide beverage dispensing applications <u>or Theatrical Fog Effects</u>	875 (100 lbs.)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any amount
Toxic	Any amount
<u>Liquefied carbon dioxide</u>	<u>875 (100 lbs.)</u>

Justification: This change is in recognition of standard industry practices and more accurately reflects a quantity that can present an inhalation hazard. This is necessary due to the prevalence of special effect systems that utilize liquid carbon dioxide

SNBO Justification: Theatrical Fog Effects are released into the breathing space of performers and members of the audience during shows. This amendment lists a permit threshold for this type of permit. Amendments required to address special uses and occupancies.

105.6.4

~~105.6.4 Carnivals and Fairs. An operational Permit is required to conduct carnival or fair.~~

Justification: The proposed amendment eliminates Section 105.6.4 since carnivals and fairs are also outdoor assembly events that will require a permit under Section 105.6.36.

SNBO Justification: Amendments required to address special uses and occupancies; Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law; Amendments required to provide for consistency in regional interpretation and application of the codes

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: The current code requires all LPG to have a permit, and sets a limit to potentially require operational permits of R-3 occupancies. This amendment makes all Group R-3 occupancies exempt from an LP-gas operational permit (note that construction permit still can be required from Section 105.7.16). For all other occupancies it establishes a 30-gallon threshold for operational permits thereby exempting a single BBQ propane tank from needing a permit.

SNBO Justification: Amendments required to clarify the intent of the codes.

105.6.51 thru 105.6.57

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

105.6.52 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.

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

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

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

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

105.6.57 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 321.

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

SNBO Justification: Amendments required to address special uses and occupancies.

105.7.4

105.7.4 Compressed gases. Where 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~~ business days of commencement of work.
3. Category 3 compressed air and/or piped vacuum systems as defined by NFPA 99, *Standard for Health Care Facilities*.

Justification: To clarify the intent of the code to include construction permits for medical gas systems and to provide an exception for Category 3, dental air and vacuum, systems. Change "working days" to "business days". This is written to take into account a weekend; however, some jurisdictions are closed on Fridays, and it is possible to have a 4-day closure if a holiday falls on Monday.

SNBO Justification: Amendments required to clarify the intent of the codes. Amendments required to address local fire response capabilities (business operations).

105.7.5

105.7.5 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 CO₂ 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 CO₂ 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.

SNBO Justification: Amendments required to address special uses and occupancies

105.7.7

105.7.7 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.

SNBO Justification: Amendments required to clarify the intent of the codes

105.7.26 thru 105.7.30

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

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

105.7.28 Refrigeration systems. A construction permit is required for installation of a mechanical refrigeration system covered by Section 605.

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

105.7.30 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.

SNBO Justification: Amendments required to address special uses and occupancies

109

SECTION 109 BOARD OF APPEALS

109.1 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*.

109.2 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 not have authority to waive requirements of this code.

109.3 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.

SNBO Justification: Amendments required to clarify the intent of the codes

202

SECTION 202 GENERAL DEFINITIONS

Amendment to portions of the definition for OCCUPANCY CLASSIFICATION

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

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

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

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

[BG] 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

[BG] 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.

[BG] ~~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.

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

[BG] ~~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.

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

Apartment houses

Condominiums (nontransient)

Congregate living facilities (nontransient) with more than 16 occupants

Boarding houses (nontransient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Hotels (nontransient)

Live/work units

Motels (nontransient)

Vacation timeshare properties

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*

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

Congregate living facilities (nontransient) with 16 or fewer occupants

Boarding houses (nontransient)

Convents

Dormitories

Fraternities and sororities

Monasteries

Congregate living facilities (transient) with 10 or fewer occupants

Boarding houses (transient)

Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants

[BG] Care facilities within a dwelling. Care facilities for ~~six 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 IRC.

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.

Justification: This amendment is proposed to provide correlation between the 2018 IBC approved amendments and the IFC amendments.

SNBO Justification: Amendments required to clarify the intent of the codes

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.

SNBO justification: Amendments required to address special uses and occupancies

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.~~
Bonfires are prohibited.

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

SNBO Justification: Amendments required to address special uses and occupancies

307.4.4

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

Justification: This is an existing practice in local jurisdictions to provide guidance on the location of barbecue pits placed in and near buildings.

SNBO Justification: Amendments required to address special uses and occupancies

307.6

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

Justification: This proposal is to add requirements for LP and natural gas fueled fire places, fire pits and decorative appliances used in assembly occupancies and public display are to be evaluated and certified by a national recognized testing agency. Section 307.4.3 addresses solid fuel (wood burning) outdoor fireplaces. LP-gas and natural gas fire places and fire pits pose hazards associated with the inadvertent release of unburnt fuel contact burns. Many outdoor fire pits and fireplaces sold for residential use do not have gas safety controls and intrusion protection necessary for a commercial application. Decorative appliances are not currently addressed. These would include fire tables, flaming signs and the like that are not addresses as theatrical effects. The appliances should be UL listed or approved by an independent agency such as CSA (formerly the American Gas Association). The use of UL listed and/or CSA approved components is not equivalent to a UL listing or CSA approval of the completely assembled unit.

SNBO Justification: Amendments required to address special uses and occupancies; Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law.; Amendments required to provide for consistency in regional interpretation and application of the codes.

308.1.4

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

Exceptions:

1. One- and two-family dwellings
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 2 ½ 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 if a building protected with fire sprinklers. This is necessary to ensure that outdoor cooking activities do not initiate fires.

SNBO justification: Amendments required to address special uses and occupancies

308.1.6.2

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

Exceptions:

1. LP-gas-fueled devices used for seating pipe joints or removing paint in accordance with Chapter 61.
2. Cutting and welding operations in accordance with Chapter 35.
3. Torches or flame-producing devices in accordance with Section 308.4
4. Candles and open-flame decorative devices in accordance with Section 308.3.

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

Justification: There have been unwanted fires due to the use and misuse of portable stoves in assembly occupancies. Research found that there is a standard available for listing purposes. This amendment proposes to require only those devices that are listed to be used in this section.

SNBO justification: Amendments required to address special uses and occupancies

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 through 10 of 308.3.1 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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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 at an angle of 45 degrees.
3. Oil lamps containing more than 8 ounces (237 ml) shall self-extinguish and not leak at a rate of more than 0.25 teaspoon per minute (1.26 ml per minute) when held at an angle of 45 degrees.
4. Holders and chimneys shall be made of noncombustible materials. Chimneys are not required for candles, oil lamps or tea lights that self extinguish when tipped over.

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

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

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

SNBO Justification: Amendments required to address special uses and occupancies

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 known to be hazardous such as those sanctioned by the Consumer Products Safety Commission.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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) if 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.

SNBO Justification: Amendments required to address special uses and occupancies

314.4

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

1. Batteries are disconnected, or the engine starting system is made inoperable, except where the *fire code official* requires that the batteries remain connected to maintain safety features.
2. Fuel in fuel tanks does not exceed one-quarter tank or 5 gallons (19 L) (whichever is least)
3. Fuel tanks and fill openings are closed and sealed to prevent tampering
4. Vehicles, aircraft, boats or motorcraft equipment are not fueled or defueled within the building.

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

SNBO Justification: Amendments required to address special uses and occupancies

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 building code official identifying the minimum required width of the corridors or hallways.
5. When required by the fire code official, a fire protection report shall be submitted addressing the parameters of storage, including protection requirements, separation requirements, and description of commodity type and configuration.
6. Master egress drawings are provided to the fire code official and the building official.

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

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

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

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

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

SNBO Justification: Amendments required to address special uses and occupancies

320

SECTION 320 INDOOR TRADE SHOWS AND EXHIBITIONS

320.1 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 105.6.13

320.2 Exhibit Booths. Booths shall comply with 320.2.1 through 320.2.5.

320.2.1 Automatic Sprinklers

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

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

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

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

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

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

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

320.2.2 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.).

320.2.3 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).

320.2.4 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.

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

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

320.3 Decorative Curtains, and Textiles

320.3.1 Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 320, 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.

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

320.3.3 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.

320.3.4 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.

320.3.5 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 320.3.1 through 320.3.3.

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

320.4 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.
The cooking surface is limited to 288 sq in (two sq ft).
 - b. The fryer is to be separated from all other equipment by a distance not less than 24 in.
 - c. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
 - d. Deep fat fryers shall be electrically powered and have a shut-off switch.
4. Class-K fire extinguishers shall be provided within 30-ft of each cooking operation in accordance with 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.

320.5 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 (320.1-320.2) This proposal revises the title of the new section to track with Appendix N of the 2018 IFC. This section is proposed to be adopted in lieu of Appendix N. The requirement to an operational permit is given in Section 105.6.13.

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 12.7.5.3.4 and 13.7.5.3.4 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 320.2 through 320.5 give specific requirements. Section 320.2: The prohibition of booth exceeding 1,500 square feet in nonsprinklered buildings tracks with the requirements of IFC 2018 Appendix N.

*Justifications:**Sprinklers:*

Section 320.2.1 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 2018 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 1029.8 of the 2018 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 2018 IFC. Other plastics may comply with the 2018 IBC. An additional item is added to allow approval of alternate materials by the *fire code official*.

SNBO Justification: Amendments required to address special uses and occupancies

Justification (320.3): Section 320.3.1 and Section 320.3.2: 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 for fabrics used within buildings.

Section 320.3.3: This section prohibits draperies from obstructing any means of egress components or fire safety equipment.

Section 320.3.4: 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 320.3.5 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.

Section 320.3.6 was added since the IFC now has requirement regulating artificial decorative vegetation.

SNBO Justification: Amendments required to address special uses and occupancies

Justification (320.4): These requirements are mainly taken from 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.

The previous code cycle requirements for extinguishing systems and hoods was removed since such appliances are not allowed in exhibits and trade shows. Also, the volume of cooking oil is no longer restricted since the limitation of cooking surface area is sufficient to mitigate the hazard.

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

Justification (320.5): 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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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: 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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

503.2.8

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

SNBO Justification: Amendments required to address local fire response capabilities

503.2.9

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

Justification: This amendment is intended to provide consistency for regional application of codes. The purpose of this amendment is to set the ground bearing capacity needed to support fire apparatus point loads. This amendment is also to ensure that fire apparatus access roads on top of buildings are designed for the point loading.

SNBO Justification: Amendments required to address local fire response capabilities

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 markings shall be 50 feet, as measured along the centerline of the fire apparatus access lane.

503.3.1 Sign Specifications. Where required by the fire code official signs shall be in accordance with 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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

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

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

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

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

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

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

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

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

503.6.5 Plans and Specification. 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.

SNBO Justification: Amendments required to address local fire response capabilities

505.1

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

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

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to clarify the intent of the codes.

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.

SNBO Justification: Amendments required to clarify the intent of the codes.

508.1.6

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

1. The emergency voice/alarm communication 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
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking interior exit stairway doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. An *approved* Building Information Card that contains, but is not limited to, the following information:
 - 13.1 General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), and the estimated building population during the day, night and weekend;
 - 13.2 Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer, 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 including but not limited to floors, walls, columns, and roof assembly;
 - 13.4 Exit access stairway and exit stairway information that includes: number of *exit access stairways* and *exit stairways* in the building; each exit access stairway and *exit stairway* designation and floors served; location where each exit access stairway and *exit stairway* discharges, interior *exit stairways* that are pressurized; *exit stairways* provided with emergency lighting, each *exit stairway* that allows reentry; *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks;
 - 13.5 Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, 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 and location of different types of *automatic sprinkler systems* installed including but not limited to dry, wet and pre-action;
 - 13.7 Hazardous material information that includes: location and quantity of hazardous material.
14. A new 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/CSA B44.
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: Added requirements for items needed in the Fire Command center to facilitate emergency response

SNBO Justification: Amendments required to address local fire response capabilities.

508.1

508.1 General. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided and shall comply with Sections 508.1.1 through 508.1.6. When required, a secondary response point shall comply with Section 508.2.

508.2

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

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

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

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

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

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

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

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. This amendment enhances local fire response capabilities in these unique uses and occupancies.

SNBO Justification: Amendments required to address special uses and occupancies with fire command centers.

510

SECTION 510

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.

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. 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 907.2.12.2 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 Permit required. A Construction and operational permits for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Sections 105.6 and 105.7.6. 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 agency radio system requirements is the responsibility of the owner and contractor.

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

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

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

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

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

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

510.4 Technical requirements. The system shall be capable of transmitting all public safety radio frequencies assigned to the agency's, and be capable of using any modulating technology. Systems, components and equipment required to provide the emergency responder radio coverage system shall comply with Sections 510.4.1 through 510.4.2.9.

510.4.2 System design. The emergency responder radio coverage system shall be designed in accordance with Sections 510.4.2.1 through ~~510.4.2.8~~ 510.4.2.9, NFPA 70, NFPA 72 and NFPA 1221.

510.4.2.3 Standby power. Emergency responder radio coverage systems shall be provided with dedicated standby batteries or provided with 4 ~~2~~-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the emergency responder radio coverage system at 100-percent system capacity for a duration of not less than ~~12~~ 24 hours.

510.4.2.5 System monitoring. The emergency responder radio enhancement system shall be monitored by a listed fire alarm control unit, or where *approved* by the *fire code official*, shall sound an audible signal at a constantly attended on-site location.

Automatic supervisory signals shall include the following:

Items 1 – 7 are *unchanged*.

8. Supervisory signals required by NFPA 1221.

510.4.2.7 ~~Design documents.~~ The fire code official shall have the authority to require “as-built” design documents and specifications for emergency responder communications coverage systems. ~~The documents shall be in a format acceptable to the fire code official.~~ **Pathway Survivability.** The system shall be designed with a designated pathway survivability as described in NFPA 72 Section 24.3.13.8 and NFPA 1221 Section 9.6.2. ~~The fire code official shall have the authority to require a fire and non-fire risk analysis be prepared to specify and document the pathway survivability design and installation requirements.~~

510.4.2.8 *Unchanged.*

Exceptions:

1. *Unchanged.*
2. *Unchanged.*

510.4.2.9 Cable.

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

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

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

510.5 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with NFPA 70, NFPA 72, NFPA 1221 and Sections 510.5.1 through 510.5.4.

510.5.3 Acceptance test procedure. Where an emergency responder radio coverage system is required, annually and upon completion of installation, the building owner shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 95 percent. The test procedure shall be conducted as follows:

Items 1 – 8 are unchanged.

510.6 Maintenance. The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through ~~510.6.4~~ **510.6.5.**

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

1. *Unchanged.*
2. *Unchanged.*
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage.

If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined. Individual batteries shall be tested in accordance with NFPA 72, Chapter 14.

4. *Unchanged.*

5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the *fire code official*. A copy of this report shall also be maintained on-site for three years.

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

510.6.5 Operational Maintenance.

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

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

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.

SNBO Justification: Amendments required to address local fire response capabilities.

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" applies to fuels (such as diesel) that are intended for use in an internal combustion engine.

SNBO justification: Amendments required to clarify the intent of the codes.

603.3.2.2

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 603.3.2.2 are to normalize the code from previous code cycles. 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.

SNBO justification: Amendments required to clarify the intent of the codes.

605.5

605.5 Access. Access to 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 1102.2 of the Uniform Mechanical Code shall be provided for the fire department at all times as required by the *fire code official*.

Justification: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code. 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.

SNBO justification: Amendments required to provide for consistency in regional interpretation and application of the codes (adoption of the UMC) and .Amendments required to clarify the intent of the codes.

605.6

605.6 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 1102.2 of the Uniform Mechanical Code shall be subject to periodic testing in accordance with Section 605.6.1. Records of tests shall be maintained. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

Justification: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code.

SNBO justification: Amendments required to clarify the intent of the codes.

605.7

605.7 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 1102.2 of the Uniform Mechanical Code shall be provided with *approved* emergency signs, charts and labels in accordance with NFPA 704. Hazard signs shall be in accordance with the *International Mechanical Code* for the classification of refrigerants listed therein.

Justification: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code.

SNBO justification: Amendments required to clarify the intent of the codes.

605.9

605.9 Remote controls. Where flammable refrigerants are used and compliance with Section ~~1106~~ 1107.0 of the ~~International~~ Uniform Mechanical Code is required, remote control of the mechanical equipment and appliances located in the machinery room as required by Sections 605.9.1 and 605.9.2 shall be provided at an approved location immediately outside the machinery room and adjacent to its principal entrance.

Justification: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code.

SNBO justification: Amendments required to clarify the intent of the codes.

605.11

605.11 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)~~ the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code of any other group refrigerant. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

Exception: 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: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code.

SNBO justification: Amendments required to clarify the intent of the codes.

605.16

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

Exceptions:

1. Ammonia machinery rooms that are provided with ventilation in accordance with Section ~~1106.3~~ 1106.2.5.1 of the ~~*International Uniform Mechanical Code*~~.
2. Machinery rooms for systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 605.17.

Justification: These amendments correlate the quantities, access, testing signage, controls, storage, use, and electrical requirements between the Uniform Mechanical Code and the International Fire Code.

SNBO justification: Amendments required to clarify the intent of the codes.

606.1

606.1 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.

SNBO Justification: Amendments required to address local fire response capabilities.

607.3.5

607.3.5 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.

SNBO justification: Amendments required to clarify the intent of the codes.

607.3.6

607.3.6 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.

SNBO justification: Amendments required to clarify the intent of the codes.

806.1.1

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

Exceptions:

1. ~~Trees 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.

SNBO Justification: Amendments required to address special uses and occupancies

807.1

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

1. Furnishings or decorative materials of an explosive or highly flammable character shall not be used.
2. Fire-retardant coatings in existing buildings shall be maintained so as to retain the effectiveness of the treatment under service conditions encountered in actual use.
3. Furnishings, draperies, hanging fabrics or other objects shall not be placed to obstruct exits, access thereto, egress therefrom or visibility thereof, and shall not obstruct fire protection and fire alarm devices and equipment, and shall not restrict the proper operation of such devices.
4. The permissible amount of noncombustible decorative materials shall not be limited.

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

SNBO justification: Amendments required to clarify the intent of the codes.

901.2.2

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

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

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

Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law. Required by state law.

NAC 477.300 Application; requirements; effect; access to systems for protection from fire. (NRS 477.030, 477.033)

12. A designer of fire sprinkler or alarm systems must:

- (a) Hold a Level II certification from the National Institute for Certification in Engineering Technologies (NICET), or an equivalent certification; or
- (b) Be licensed as a professional engineer pursuant to chapter 625 of NRS.

13. A designer of special hazard suppression systems must:

- (a) Hold a Level II certification from the National Institute for Certification in Engineering Technologies (NICET), or an equivalent certification; or
- (b) Be licensed as a professional engineer pursuant to chapter 625 of NRS.

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

SNBO Justification: Amendment required to clarify the intent of the codes and to correlate the provisions of a given national model code with other national model codes or prevailing State law. Required by state law.

901.4.6 – 901.4.8

Section 901.4.6 Pump and riser room size. Where provided, fire pump rooms ~~and automatic sprinkler system riser rooms~~ shall be designed with adequate space (see NFPA 20 for fire pump clearances and NFPA 70 for working space clearances) for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump ~~and automatic sprinkler system riser rooms~~ shall be provided with doors and unobstructed passageways large enough to allow removal of the largest piece of equipment.

901.4.6.1 Access. ~~Automatic sprinkler system risers, fire~~ Fire pumps and controllers shall be provided with ready access. Where located in a pump room ~~or automatic sprinkler system riser room~~, the door shall be permitted to be locked provided that the key is available at all times.

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

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

901.4.6.3 Lighting. Permanently installed artificial illumination shall be provided in the automatic sprinkler system riser rooms and fire pump rooms.

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

Exceptions:

1. Where approved by the *fire code official*, where systems are controlled by wall-mounted Post Indicator Valves (PIV), and where exterior access is provided to the monitoring panel that is located in a conditioned room, an automatic sprinkler system riser room is not required.
2. When approved, where a single system serves the building and the system is controlled by a PIV, a riser room is not required.
3. In multi-story facilities, floor control risers are permitted to be located on each floor level in an exit stair enclosure.
4. Systems designed in accordance with Section 903.3.1.3 (NFPA 13D) do not require an automatic sprinkler system riser room.
5. Systems designed in accordance with Section 903.3.1.2 (NFPA 13R) shall have an automatic sprinkler system riser room/closet that is large enough to facilitate access to all the necessary fire sprinkler and fire alarm valves and devices. This area shall be accessible from the outside with either a door or an access panel large enough to allow for testing and maintenance of system. The area shall also maintain a minimum temperature of 40° F and a maximum temperature of 100° F.
6. Fire pump rooms complying with Section 901.4.6.

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

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

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

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

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

901.4.7.4 Size. The riser room shall have a minimum area of 16 square feet (1.49 m²), with a minimum dimension of 4 feet for the first sprinkler riser plus an additional 9 square feet for each additional riser contained.

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

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

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

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

Exceptions:

1. Where the fire sprinkler riser room or fire pump room does not contain a Fire Alarm/Monitoring Panel or spare sprinklers heads, or when these devices are rated for higher ambient temperatures the room shall not be required to be conditioned for maximum temperature.

2. Heating and/or conditioning is not required if calculations are prepared and sealed by a design professional, on a case-by case address specific basis, proving that the temperature within the riser room does not fall or rise below the temperature range of 40° F to 100° F. To maintain 40° F, the temperature analysis must use a starting temperature of 50° F and use an outside temperature of 0° F for a period of 8 hours. To maintain 100° F, the temperature analysis must use a starting temperature of 90° F and use an outside temperature of 120° F for a period of 8 hours.

3. Where the fire sprinkler riser room or fire pump room contains equipment that has a higher manufacturer's temperature rating acceptable to the fire code official.

Justification: The purpose of these amendments is to provide the minimum requirements for fire pump and fire sprinkler riser room construction. This is necessary to facilitate maintenance and fire operations of this equipment during emergencies.

Given the costs associated with the design and installation of fire protection systems, it is important that these systems be maintained. The codes and standards have extensive requirements for their maintenance. However, maintenance can be difficult to perform if adequate space is not provided to allow personnel access for the removal of large, cumbersome, or heavy components such as pump casings, control valves, or alarm check valves.

Sections 901.4.6 and 901.4.7 establish new requirements to ensure rooms housing fire protection system risers or fire pumps and their components have adequate space to facilitate their maintenance. When a room is required these sections require that it be adequately sized to allow for maintenance.

The basis for the room specified is founded on experience and clearances specified by the equipment manufacturers to ensure adequate space is available for its installation or removal. The design must provide enough area so that walls, finish materials, or doors are not required to be removed during maintenance activities. The provision also prescribes that the size of the door serving a riser or pump room is of a size to accommodate the removal of the largest piece of equipment.

Because the design of fire protection systems generally commences during the period that building construction drawings and specifications are being reviewed by the jurisdiction, it will be especially important for building designers to establish dialogue with the fire protection system contractor early in the design process to provide the necessary space and openings needed for equipment maintenance.

SNBO Justification: Amendments required to clarify the intent of the codes as it pertains to the requirements for fire pump and fire sprinkler riser rooms.

901.10

901.10 Recall of fire protection components. *Any fire protection system component regulated by this code that is the subject of a voluntary or mandatory recall under federal law shall be replaced with approved, listed components in compliance with the referenced standards of this code. 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 functioning properly.

SNBO Justification: Amendment required to clarify the intent of the code and to address the requirement for inspecting replaced fire protection recalled equipment to ensure operability.

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: The purpose of this section is to require that a building be fully sprinklered. 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.

SNBO Justification: Amendment required to ensure that buildings are fully sprinklered. Alternative systems can always be proposed using the option provided by Section 104.12.3.

903.2

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

1. For buildings constructed in accordance with the International Building Code, approved automatic sprinklers systems are required where the building area exceeds 5,000 square feet (464 m²).
2. For buildings constructed in accordance with the International Residential Code, approved automatic sprinkler systems are required where the living space exceeds 5,000 square feet (464 m²).
3. For any buildings, not otherwise requiring fire sprinklers, where the available fire flow does not meet the fire flow requirements of this code, approved automatic sprinkler systems shall be provided as required by the fire code official.

~~**Exception:** Spaces or areas in telecommunications 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 smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code or not less than 2-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.~~

Exceptions:

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

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

Exceptions:

1. Where a building is subdivided into separate buildings, each having a total building area of less than 5,000 sq ft (464 m²), by fire walls with no openings constructed in accordance with the International Building Code.
2. Special hazard areas that required sprinklers for certain uses, such as medical gas rooms, may be fire sprinklered without requiring additional fire sprinklers throughout the building, when approved by the fire code official.

Justification: This proposal continues the fire sprinkler requirements for all buildings at 5,000 sf.

The charging paragraph has been rewritten to clarify how the 5,000 sf trigger applies to IBC and IRC buildings. The IBC trigger is based on building area, whereas the IRC trigger is based on living space, which is how Clark County currently triggers fire sprinklers in IRC single family homes and townhouses. In order to be very clear with design professionals about the impact of fire flow on fire sprinklers requirements, a third sprinkler trigger is added to address lack of fire flow.

The exception for telecommunications rooms is again proposed to be deleted. Due to local deletion of sprinkler exemption code requirements from the IFC and NFPA 13, the telecommunications room would be an outlier in terms of what rooms do and do not receive fire sprinkler protection. Deletion of this exception provides greater consistency in application of fire sprinkler requirements throughout all of the applicable codes.

The current exception for open parking garages is proposed to be modified. Whereas previously open parking garages would only get fire sprinklered if there was other occupancy above the garage, the modification would also require fire sprinklers where the fire apparatus access lanes do not front onto a sufficient amount of the building perimeter. There has been a recent development of “wrap” buildings where an open parking garage is surrounded on all sides with building (blocking all fire access lanes), and the open parking garage meets the openness requirements with mechanical ventilation instead of open side yards. If the open parking garage does not provide sufficient access, then fire sprinklers are being required, per this revision.

The proposed exceptions 2-5 are currently used in Clark County. The exception for equestrian facilities was adopted following a state NRS adoption and a request by a former commissioner to revise requirements applicable to those occupancies. The exception for utilities is carried over to provide consistency in review of certain unmanned facilities for utilities in Nevada. The canopy structure exception was adopted within Clark County to provide more lenient treatment for larger playground and motor fuel dispensing canopy structures. The exception regarding expansion of single-family homes is provided to avoid having to track additions in residential homes, and provides a more lenient treatment to residential customers.

The paragraph regarding the continuation of fire sprinklers throughout a building is carried over. Previous amendments to this section required the wall rating to be 4-hours. This amendment allows the IBC to specify the rating of the fire wall. The exception for a fire wall without openings has been used in the valley since the days of the UFC adoptions, and provides a substantial alternate means of protection for any facility wishing to partially fire sprinkler a building. The deletion of openings ensures that no single user will be able to mix sprinkler and non-sprinklered building areas by blocking any openings. The exception for medical gas rooms and any other similar uses recognizes that the requirements for one or two sprinkler heads for a single specific hazard should not in itself be used as a means to trigger full sprinkler protection throughout the buildings.

Local fire agencies response is directly impacted by this amendment. Having fire sprinklers in all buildings greater than 5,000 square feet enables responders to focus on saving lives and suppression as the fire sprinklers are normally able to control the fire until the responders arrive. Property loss is lower in sprinklered buildings.

SNBO Justification: Amendments required to clarify the requirements for fire sprinkler systems in buildings based on past practices and local fire response capabilities.

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 Group E *fire areas* greater than ~~12,000~~ 5,000 square feet (~~1115.464~~ 464m²) in area.
2. The Group E fire area is located on a floor other than a level of exit discharge serving such occupancies.
Exception: In buildings where every classroom has not fewer than one exterior exit door at ground level, an automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area
3. The Group E Fire area has an occupant load of 300 or more.
4. Daycare facilities where there is occupancy from 12:00 AM - 6:00 AM and care for 7 or more children.

Justification: Section 903.2 changed the threshold to 5,000 square feet for all occupancy types. Based on an area of 5,000 square feet the occupant load for daycare using an occupant load factor of 35 SF Net is 143 and for classrooms using an occupant load factor of 20 SF Net is 250. Both calculated occupant loads are well below the 300 occupant load limit; however, the committee decided to leave condition 3 in the amendment. The new condition 4 is needed to correlate with State law NAC 477.568.

SNBO Justification: Amendment required to address requirements for fire sprinklers in E occupancies and to correlate the provisions of a given national model code with the prevailing State law.

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 duct lengths in excess of 75 feet.

SNBO Justification: Amendment required to clarify the intent of the code and to address unique designs or systems not anticipated in the code with regard to commercial cooking duct systems.

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 high hazards such as plastics and rubber tire storage.

SNBO Justification: Amendment required to protect the interest of the building owner by clarifying the requirements for minimum fire sprinkler design standards in buildings with potential high-piled storage capacity.

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, machinery spaces, control rooms and control 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 change to be combustible over time. The remaining exemptions are based strictly on the application of water causing a hazardous condition for emergency responders.

SNBO Justification: Amendment required to clarify the intent of the code with respect to areas in which fire sprinklers may be eliminated.

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 in buildings not exceeding 60 feet (18 288 mm) in height above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R.

The number of stories in Group R occupancies constructed in accordance with Section 510.2 and 510.4 of the International Building Code shall be measured from the horizontal assembly creating separate buildings.

Justification: This is continuation of an existing amendment that has been part of the fire code for more than two decades. Structures using NFPA13R are commercial buildings. The use of NFPA 13R as an alternate to NFPA 13 in commercial structures is defined in this section of the Fire Code. The purpose of this amendment is to change the scope of NFPA 13R from 4 stories to 2 stories. This is in line with current practices. For more than 20 years state and local laws and ordinances restricted NFPA 13R to one and two story residential occupancies. Further, this amendment addresses a growing concern across the nation about how to properly protect wood frame residential buildings. Recent fire incidents have forced a rethinking of the protection provided by the code. By forcing the use of NFPA 13 systems in those buildings, a higher level of protection is brought to one of the more sensitive occupancies dealt with in the code.

NFPA 13R is not a property protection standard. NFPA 13 is a property protection standard. The use of NFPA 13R increases the communities risk to fire loss due to: lower water density allowances; loss of protection to combustible spaces; loss of protection to combustible attics and greater loss due to shorter egress times, particularly in housing used by elderly. Continuing this amendment will not create a decrease in local fire response capabilities. If this amendment is not continued local fire agencies will need to add more staff and apparatus to enable a quicker response and to maintain current levels of safety.

SNBO Justification: Amendment required to limit the height of buildings in which NFPA 13R fire sprinkler systems may be installed, so as to maintain current levels of protection and to not overtax local fire response capabilities. This amendment is required to address local fire response capabilities.

903.3.5.3

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

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.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to protecting public water supplies.

903.4

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

Exceptions:

1. *Automatic sprinklers* systems protecting one- and two-family dwellings.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. *Automatic sprinklers* systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler* system, and a separate shutoff valve for the *automatic sprinkler* system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to ~~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.

SNBO Justification: Amendment required to clarify the intent of the code as it pertains to kitchen hood systems.

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.

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. The second change addresses the valves associated with the backflow prevention device required by the water purveyor. Further, the added code section discusses additional monitoring requirements for monitored fire sprinkler systems, including how signals are to be handled. This impacts how local fire agencies respond to these signals.

SNBO Justification: Amendment required to clarify the intent of the code and to address local fire response requirements as it pertains to monitoring systems.

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 each automatic sprinkler system. Such sprinkler waterflow 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 wall-mounted Fire Department Connection. One interior audible and visual notification appliance shall be provided near the main entrance or in a normally occupied location. In multiple-tenant facilities, one interior audible and visual notification appliance shall be provided near the main entrance or in a normally occupied location for each tenant space.~~ Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

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, each tenant is required to have one alarm notification appliance.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to notification appliances.

903.4.3

903.4.3 Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor ~~in high-rise buildings~~ 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. Section 903.4.1 requires separate zone annunciation in multi-story facilities on a floor-by-floor basis. This conforms with the current practices, and also with the adoption package for NFPA 13.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to floor control valves.

903.4.4

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

Justification: Isolation control valves have been required in previous Southern Nevada Amendment through an amendment to NFPA 13. An amendment to section 903 of the IFC near the requirement for floor control valves in section 903.4.3 is more appropriate than an amendment to NFPA 13. The application to the requirement to existing buildings is addressed by enforcement of the International Existing Building Code.

Section 914.2.1 item 5 of the IFC states: *Where tenant spaces are supplied by the same system, they shall be independently controlled.*

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 where the system is being worked on. This impacts fire response capabilities by limiting the size of the areas out of service for sprinkler systems feeding these areas.

SNBO Justification: Amendments required to address special uses and occupancies; Amendments required to clarify the intent of the codes; Amendments required to provide for consistency in regional interpretation and application of the codes; and Amendments required to address local fire response capabilities.

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 the *International Existing 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. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area of the addition where the addition fire area is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.
2. When approved by the *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 m²) and the addition does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. In other than Group H occupancies, the *fire area* containing the addition is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.

903.7.2 Alterations. Alterations within existing building shall comply with this Section and the *International Existing 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. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the alteration where it is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.
2. When approved by the *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 the *International Existing 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. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the change of occupancy where it is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.
2. 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 m²) and the change of occupancy does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. In other than Group H occupancies, the *fire area* containing the change of occupancy is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707, and without openings.
3. When approved by the *building official*, 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.

SNBO Justification: Amendments required to clarify the intent of the codes

904.2

904.2 Where permitted. ~~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*.~~

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.

SNBO Justification: Amendment required to ensure that buildings are fully sprinklered. Alternative systems can always be proposed using the option provided by Section 104.12.3.

904.12.5.2

904.12.5.2 Extinguishing system service. Automatic fire-extinguishing systems shall be serviced not less frequently than every 6 months and after activation of the system. Inspection shall be ~~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 (state fire marshal regulations) and clarification as to the regional requirement for inspections of commercial cooking systems.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to the inspection requirements for commercial cooking systems.

905.3

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

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

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

JUSTIFICATION: The referenced NFPA standard requires the standpipe designer to consult with the authority having jurisdiction / *fire code official* regarding the standpipe design. 2016 NFPA 14 Section 5.1.2 The AHJ shall be consulted regarding the required type of system, class of system, and special requirements.

In determining the requirements for and designing a standpipe system for a building the responsible engineer/contractor needs to know the requirements of both the local building/fire codes and referenced NFPA standards. In addition to these documents the responsible engineer or fire protection contractor needs to consult and work with the *fire code official* to ensure that all parties understand the design and installation requirements and that the design supports the responding fire department operational tactics.

This revised section removes confusion related to standpipe system design type based on local operational tactics.

The reference standard describes five types of systems. These are:

- **Automatic dry:** Contains air or nitrogen under pressure. Opening a hose valve releases the air or nitrogen and automatically admits water into the standpipe system. *A standpipe system permanently attached to a water supply capable of supplying the system demand at all times, containing air or nitrogen under pressure, the release of which (as from opening a hose valve) opens a dry pipe valve to allow water to flow into the piping system and out of the opened hose valve.*
- **Automatic wet:** Retains water in the piping at all times and is capable of automatically supplying the correct water pressure and flow. *A standpipe system containing water at all times that is attached to a water supply capable of supplying the system demand at all times and that requires no action other than opening a hose valve to provide water at hose connections.*
- **Manual dry:** Contains air, but does not have an automatic water supply. Fire department pumpers add water to the system. *A standpipe system with no permanently attached water supply that relies exclusively on the fire department connection to supply the system demand.*
- **Semiautomatic dry:** Requires someone to activate a remote control device manually to admit water into the standpipe system. *A standpipe system permanently attached to a water supply that is capable of supplying the system demand at all times arranged through the use of a device such as a deluge valve and that requires activation of a remote control device to provide water at hose connections.*
- **Manual wet:** Retains water in the piping at all times, but is not capable of providing adequate pressure and flow. The fire department must use its pumpers to augment the water supply. *A standpipe system containing water at all times that relies exclusively on the fire department connection to supply the system demand.*
- **Wet:** Wet Standpipes are filled with water and is pressurized at all times. *A standpipe system having piping containing water at all times.*

Securing standpipe inlets and outlets aids in maintaining the piping integrity and improves the reliability of the standpipe system.

SNBO CRITERIA: Amendments required to provide for consistency in regional interpretation and application of the codes and amendments required to address local fire response capabilities.

905.3.1

905.3.1 Height. Approved Class I ~~III~~ standpipe systems shall be installed throughout buildings where any of the following conditions exist:

1. Four or more stories are above or below grade plane
2. The floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access.
3. The floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of the fire department vehicle access.

Exceptions:

1. ~~Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2~~
2. ~~Class I standpipes are allowed in Group B and E occupancies.~~
3. ~~Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access~~

- ~~4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.~~
- ~~5. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.~~
- ~~6. Class I standpipes are allowed in buildings where occupant use hose lines will not be utilized by trained personnel or the fire department~~
- ~~7.~~

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

- ~~7.1.~~ 1. Recessed loading docks for four vehicles or less, and
- ~~7.2.~~ 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 standard, which requires that a standpipe system be automatic when the building is of a height defined by a high-rise. Exception #7 is retained but rewritten as a requirement instead of an exception.

SNBO Justification: Amendment required to address local fire response capabilities as it pertains to standpipe systems.

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 interior exit stairways opening directly on the mall.
3. At exterior public entrances to the mall of a covered mall building.
4. At public entrances at the perimeter line of an open mall building.
5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 100 feet (30 480 mm) of hose and 30-foot (9144 mm) of stream 200 feet (60 960 mm) from a hose connection. The length of hose shall be measured along normal walking routes, and the stream shall not be expected to penetrate walls or windows.

Justification: The amendment to item 5 is to address spacing of hose connections. This amendment considers 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 a maximum of 30 feet.

SNBO Justification: Amendment required to address local fire response capabilities as it pertains to standpipe outlet requirements in covered and open mall buildings.

905.3.9

905.3.9 Building area. When required by the *fire code official*, buildings in excess of 10,000 square feet (929 m²) in area per level shall be equipped with a Class I standpipe system where any portion of the building's interior area is more than 200 feet (60,960 mm) measured vertically and horizontally from the nearest point of fire department apparatus access.

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; therefore, travel distances in excess of 200 feet warrant the requirement for standpipe outlets at entry points into the building and at additional locations such that the entire building can be covered with 100 feet of hose and 30 feet of stream.

SNBO Justification: Amendment required to address local fire response capabilities and limitations on their standard operating procedures as it pertains to large buildings in excess of 10,000 square feet which would not otherwise require a standpipe system.

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 interior exit stairway, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at the main floor landing unless otherwise approved by the *fire code official*.
Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open stairs that are not greater than 75 feet (22 860 mm) apart.
2. On each side of the wall adjacent to the exit opening of a horizontal exit
Exception: Where floor areas adjacent to a horizontal exit are reachable from an interior exit stairway hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal exit.
3. In every exit passageway, at the entrance from the exit passageway to other areas of a building.
Exception: Where floor areas adjacent to an exit passageway are reachable from an interior exit stairway hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.
4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection located to serve the roof or at the highest landing of an interior exit stairway with access to the roof provided in accordance with Section 1011.12.
6. Throughout the entire building so that all portions of each floor level are provided with hose valve coverage utilizing 100 feet (30 480 mm) of hose and 30-foot (9144 mm) stream from any hose connection located on that floor or intermediate landing. The length of hose shall be measured along normal walking routes, and the stream shall not be expected to penetrate walls or windows. 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 6 is to address spacing of hose connections. This amendment considers 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.

SNBO Justification: Amendment required to address local fire response capabilities as it pertains to standpipe outlet requirements.

905.4.1

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

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

Justification: The intent of this amendment is to clarify what piping must be protected. The base language may be read to require protection for the feed mains of standpipe systems. This would include standpipe mains in parking garages and the risers for intermediate standpipes that may occur to serve corridors between stairs to meet the local standpipe coverage requirements. It is difficult to enclose and rate the piping running through the parking garage, and it is difficult to address how to rate the fire hose cabinets that occur with intermediate standpipes. 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 fire sprinkler protection is provided. It is noted that there is no requirement for piping protection set forth in NFPA 13. Without this amendment hose cabinet protection / outlets would also require protection.

SNBO Justification: Amendment required to clarify the intent of the code as it pertains to the protection of standpipe piping in noncombustible and fire sprinklered buildings.

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, like the revision for 903.4.1, so that no underground valves require monitoring. The second exception is deleted to ensure that all control valves on the system are monitored, except for those described in 903.4.

SNBO Justification: Amendment required to clarify the intent of the code as it pertains to the supervision of valves controlling water supplies.

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.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to the installation and maintenance requirements for portable fire extinguishers.

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.

A separate fire alarm control unit is required for each separate building. A campus system shall not substitute the requirement for a separate fire alarm control unit for each separate building. Campus systems may be allowed subject to the approval of the fire code official. When approved by the fire code official campus systems circuits shall utilize Class X circuits with weatherproof raceways.

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. When campus systems are approved this amendment provides the designer with the performance requirements needed to select and design the system.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to fire alarm control unit required per building.

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).

SNBO Justification: Amendment required to address necessary identification of the location of fire alarm control panel(s) for the local first emergency responders.

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 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

In separated mixed-use occupancy buildings the fire alarm/detection system shall be limited to the fire area that requires the system. In non-separated mixed-use occupancy buildings containing an occupancy with a fire alarm/detection system the system is required to be extended throughout the building or fire area.

A fire alarm system shall be installed throughout all buildings three or more stories in height.

Exception: Group R-3 occupancies and single-family dwellings built under the IRC.

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

Exceptions:

- ~~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 State Fire Marshal requirement (NRS 477.130). 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 really is none.

The reason to delete exception 2 is to coordinate with a previously approved IFC amendment to Section 907.2.9.1., which requires at least one manual fire alarm box to be installed at an approved location.

SNBO Justification: Amendments required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the requirements for fire alarm systems and manual fire alarm boxes.

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 section doesn't consider the notification of hearing-impaired people that may be in mercantile occupancies. The committee also felt that such a delay in notification is unjustifiable, subject to human error, staffing considerations, staff training and maintenance of instructions near the method of signal initiation.
 SNBO Justification: Amendments required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the notification of building occupants.

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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to interior corridors.

907.2.8.3 and 907.2.8.4

907.2.8.3 Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.10.

907.2.8.3.1 Smoke detectors. Smoke detectors shall operate in accordance with 907.2.10.7.

907.2.8.4 Smoke detection in sleeping areas. Smoke alarms or smoke detectors provided in sleeping areas within R-1 occupancies that are required to have a fire alarm system in accordance with this code shall be able of producing the 520 Hz low frequency audible alarm signal complying with the sleeping area requirements of NFPA 72.

Justification: This amendment enhances the waking effectiveness of high risk segments of the population in the 2018 edition of the International Fire Code (IFC) by requiring a consistent use of the 520 Hz low frequency audible fire alarm signal in new Group R-1 occupancies that are required to have a fire alarm system.

The amendment requires low frequency signals in certain buildings where the technology is commercially available and avoids requiring the low frequency signal in buildings where the technology is not currently available in the stream of commerce. The proposal has taken careful consideration to not require the low frequency technology in buildings without a fire alarm system because there are no smoke alarms currently available with an integral sounder capable of producing the low frequency signal. However, it does not prohibit their installation if the product becomes available in the future. The proposal does require the low frequency signal in sleeping areas of building with a fire alarm system because there are numerous manufacturers of system connected smoke detectors with an integral sounder that produces the low frequency signal.

Peer-reviewed research has concluded the 520 Hz low frequency is six times more effective than the standard 3 KHz signal at waking high risk segments of the population (people over 65, people who are hard of hearing, school age children, and people who are alcohol impaired). The standard 3 KHz audible alarm signal has been used in the majority of fire alarm horns and smoke alarms for the past 30 years. The reason for this Proposal is NFPA 72 stipulates both the 520 Hz and 3 KHz signal in the sleeping rooms of hotels, dormitories and apartment building bedrooms when smoke alarms are installed in the sleeping room. Specifically, Chapter 18 of NFPA 72 requires audible notification appliances (horns, speakers or smoke detectors with an integral sounder bases) to produce the 520 HZ low frequency signal in all sleeping rooms of buildings with a protected premises fire alarm system. Whereas Chapter 29 of NFPA 72 only requires smoke alarms to produce the 520 Hz low frequency signal for people with hearing loss or provided voluntarily for those with hearing loss.

The different requirements within NFPA 72 present a life safety issue because the wakening effectiveness of the 520 Hz low frequency is superior to 3 KHz audible alarm signal awakening high risk segments of the population. The low frequency signal needs to be provided in areas intended for sleeping for people over 65, people who are hard of hearing, school age children, and people who are alcohol impaired.

There are several product solutions currently available in the market capable of providing the 520 Hz low frequency signal.

- a) Fire alarm system horns and horn/strobes
- b) Smoke detectors with integral sounder bases
- c) Speakers connected to an emergency Voice Alarm Communication (EVAC) systems

Peer-Reviewed Research:

Ian R. Thomas and Dorothy Bruck, *Waking Effectiveness of Alarms for Adults Who Are Hard of Hearing* (Melbourne, Australia: Victoria University), National Fire Protection Association, 2007

Ian R. Thomas and Dorothy Bruck, *Waking Effectiveness of Alarms for the Alcohol Impaired* (Melbourne, Australia: Victoria University), National Fire Protection Association, 2007.

Product Availability (Examples, provided to show that multiple manufacturers make products that can meet this requirement):

System Sensor, B200S-LF and B200SR-LF, 520 Hz
 Simplex 520 Sounder Base, TrueAlert ES, 520 Hz
 Honeywell / Silent Night Sounder Base B200S-LF, 520 Hz
 Kidde, Sounder Bases, SB4U-LFSIGA-AB4G-LF, 520 Hz
 Siemens, Detection Bases, ABHW-4S and ABHW-4S, 520 Hz
 Gamewell / FCI, Velociti Series B200S-LF, 520 Hz
 Edwards Sounder Base, SB4U-LF, SIGA-AB4G-LF, 520 Hz
 Mircom APB200-LF, 520 Hz
 Autocall A4098-9772, 520 Hz
 Etc...

SNBO Justification: Amendments required to correlate with the national standard NFPA 72.

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 any of the following conditions apply:

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

2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains ~~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 an exterior exit access that leads directly to exits or are served by open-ended corridors designed in accordance with Section 1027.6, Exception 3.

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 Fire Marshal requirement NRS 477.130.

SNBO Justification: Amendments required to clarify the intent of the code and to correlate with the provisions of the national standard NFPA 72 and with prevailing State law.

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 dwelling units. For the purposes of this section, interior means a conditioned space.

Exception: An automatic smoke detection system is not required in buildings that do not have interior corridors serving dwelling units and where each dwelling unit has a means of egress 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 sleeping 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 unconditioned spaces. This language is added to clarify that smoke detector protection is not required in interior corridors that are not conditioned.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the requirements for automatic smoke detection in interior corridors.

907.2.9.2 – 907.2.9.4

907.2.9.2 Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.10.

907.2.9.2.1 Smoke detectors. Smoke detectors shall operate in accordance with 907.2.10.7.

907.2.9.3 Smoke detection in sleeping areas. Smoke alarms or smoke detectors provided in sleeping areas within R-2 occupancies that are required to have a fire alarm system in accordance with this code shall be able of producing the 520 Hz low frequency audible alarm signal complying with the sleeping area requirements in NFPA 72.

907.2.9.3907.2.9.4 Group R-2 college and university buildings. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group R-2 occupancies operated by a college or university for student or staff housing in all of the following locations:

1. Common spaces outside of *dwelling units* and *sleeping units*.
2. Laundry rooms, mechanical equipment rooms and storage rooms.
3. All interior corridors serving *sleeping units* or *dwelling units*.

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

Required smoke alarms in *dwelling units* and *sleeping units* in Group R-2 occupancies operated by a college or university for student or staff housing shall be interconnected with the fire alarm system in accordance with NFPA 72.

Justification: This amendment enhances the waking effectiveness of high risk segments of the population in the 2018 edition of the International Fire Code (IFC) by requiring a consistent use of the 520 Hz low frequency audible fire alarm signal in new R-2 occupancies that are required to have a fire alarm system.

The amendment requires low frequency signals in certain buildings where the technology is commercially available and avoids requiring the low frequency signal in buildings where the technology is not currently available in the stream of commerce. The proposal has taken careful consideration to not require the low frequency technology in buildings without a fire alarm system because there are no smoke alarms currently available with an integral sounder capable of producing the low frequency signal. However, it does not prohibit their installation if the product becomes available in the future. The proposal does require the low frequency signal in sleeping areas of building with a fire alarm system because there are numerous manufacturers of system connected smoke detectors with an integral sounder that produces the low frequency signal.

Peer-reviewed research has concluded the 520 Hz low frequency is six times more effective than the standard 3 KHz signal at waking high risk segments of the population (people over 65, people who are hard of hearing, school age children and people who are alcohol impaired). The standard 3 KHz audible alarm signal has been used in the majority of fire alarm horns and smoke alarms for the past 30 years. The reason for this Proposal is NFPA 72 stipulates both the 520 Hz and 3 KHz signal in the sleeping rooms of hotels, dormitories and apartment building bedrooms when smoke alarms are installed in the sleeping room. Specifically, Chapter 18 of NFPA 72 requires audible notification appliances (horns, speakers or smoke detectors with an integral sounder bases) to produce the 520 HZ low frequency signal in all sleeping rooms of buildings with a protected premises fire alarm system. Whereas Chapter 29 of NFPA 72 only requires smoke alarms to produce the 520 Hz low frequency signal for people with hearing loss or provided voluntarily for those with hearing loss.

The different requirements within NFPA 72 present a life safety issue because the wakening effectiveness of the 520 Hz low frequency is superior to 3 KHz audible alarm signal awakening high risk segments of the population. The low frequency signal needs to be provided in areas intended for sleeping for people over 65, people who are hard of hearing, school age children and people who are alcohol impaired.

There are several product solutions currently available in the market capable of providing the 520 Hz low frequency signal.

- a) Fire alarm system horns and horn/strobes
- b) Smoke detectors with integral sounder bases
- c) Speakers connected to an emergency Voice Alarm Communication (EVAC) systems

Peer-Reviewed Research:

Ian R. Thomas and Dorothy Bruck, *Waking Effectiveness of Alarms for Adults Who Are Hard of Hearing* (Melbourne, Australia: Victoria University), National Fire Protection Association, 2007

Ian R. Thomas and Dorothy Bruck, *Waking Effectiveness of Alarms for the Alcohol Impaired* (Melbourne, Australia: Victoria University), National Fire Protection Association, 2007

Product Availability (Examples, provided to show that multiple manufacturers make products that can meet this requirement):

System Sensor, B200S-LF and B200SR-LF, 520 Hz
 Simplex 520 Sounder Base, TrueAlert ES, 520 Hz
 Honeywell / Silent Night Sounder Base B200S-LF, 520 Hz
 Kidde, Sounder Bases, SB4U-LFSIGA-AB4G-LF, 520 Hz
 Siemens, Detection Bases, ABHW-4S and ABHW-4S, 520 Hz
 Gamewell / FCI, Velociti Series B200S-LF, 520 Hz
 Edwards Sounder Base, SB4U-LF, SIGA-AB4G-LF, 520 Hz
 Mircom APB200-LF, 520 Hz
 Autocall A4098-9772, 520 Hz
 Etc...

SNBO Justification: Amendments required to correlate with the national standard NFPA 72.

907.2.12

907.2.12 High-rise buildings. High-rise buildings shall be provided with an automatic smoke detection system in accordance with Section 907.2.12.1, a fire department communication system in accordance with Section 907.2.12.2 and an emergency voice/alarm communication system in accordance with Section 907.5.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
3. Unenclosed portions of B 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*. 4~~
- ~~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. This amendment was coordinated with amendments to IBC Sections 403.1 and 907.2.12. Exception #3 is aimed at enclosed portions of outdoor stadiums that include occupied floors at the high-rise height. Currently most of these facilities are in the county's jurisdiction. These structures do not require the full protection provided by the high-rise provisions of Chapter 4, however, due to the size of these structures and the number of occupants' early detection is required. Smoke poses dangers to the people inside enclosed spaces while at the

same time causing thousands of dollars to damage to the building itself in just minutes. High-rise buildings in particular have very special needs when it comes to smoke. Because smoke can travel through a building very quickly, it makes it more difficult for occupants reach clean air safely. Fires in high-rise structures require more robust fire tactics. Detection of smoke in enclosed portions of high-rise buildings will aid responding fire-fighters and start building evacuation earlier. Exception #5 addresses Group H-1, H-2 or H-3 occupancies are high-risk due to the physical and health hazards the contents of these buildings deliver. Detecting fire early in these hazardous occupancies is necessary to aid in mitigation of the risk and enable earlier fire-fighting operations within the high-hazard occupancy. Exception #6 is specific to Group I-1 and I-2 occupancies. Occupants within these occupancies typically do not evacuate the building during fires but are relocated to different smoke compartments by staff. Early detection of fire in these occupancies is essential for occupant safety and to facilitate earlier staff response. Occupants that are typically not capable of self-preservation within a building that is difficult for fire-fighters to operate exacerbates the need for early detection warning. For these reasons this amendment is deleted.

SNBO Justification: Amendments required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to fire alarm requirements for high-rise buildings.

907.2.12.1.3

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

Justification: This has been an adopted amendment for three 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 fire sprinkler system since the exact location of the fire would immediately be known.

With the current arrangement of installing standalone 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.

SNBO Justification: Amendments required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to fire alarm requirements for high-rise buildings.

907.2.12.2

907.2.12.2 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 interior *exit stairways* and other locations as required by the fire code official. The fire department communication device shall be provided at each floor level within the interior *exit stairway*.

Justification: This amendment is made so it is clear that a wired system cannot 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. Few things impact fire response more than the inability to communicate effectively. This amendment addresses fire communications and the type of hardware implemented to augment communications.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the fire department communication systems to be used by the local emergency responders.

907.2.12.3

907.2.12.3 Multi-channel voice evacuation. ~~Multiple channel voice evacuation. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, voice evacuation systems for high-rise buildings shall be multiple channel systems. Voice evacuation systems for high-rise buildings shall be multi-channel systems.~~

Justification: High rise fire operations evacuates only the floor of alarm, the floor above the alarm, and the floor below the alarm. Multi-channel systems allow alert tones to be broadcast into other evacuation zones by fire operations personnel. 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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the voice evacuation systems to be used by the local emergency responders.

907.2.12.4

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

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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the reliability of fire alarm systems in high-rise buildings.

907.2.24

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

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

Justification: The NRS/NAC has requirements (477.566) for child-care facilities that included a requirement for smoke detection in sleeping/napping areas. These detectors provide a quicker response to caregivers to facilitate safe egress of children.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to the installation of smoke detectors/smoke alarms in child-care facilities.

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 International Mechanical Code. In facilities that are required to be monitored by a supervising station, duct smoke detectors shall report only as a supervisory signal and not as a fire alarm. They shall not be used as a substitute for required open area detection.

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.

SNBO Justification: Amendment required to clarify the intent of the code and to correlate with the national standard NFPA 72 as it pertains to duct smoke detector 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 sprinkler monitoring systems shall not be required to have smoke detectors installed above the dedicated function control unit.

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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to smoke detector requirements.

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 be helpful in reducing the number of nuisance/false alarms.

SNBO Justification: Amendment required to clarify the intent of the codes and to provide for consistency in regional interpretation and application of the code as it pertains to manual fire alarm boxes.

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. Audible notification appliances shall be installed in each occupiable space.

Exceptions:

1. Laundry rooms, walk-in closets, storage rooms and walk-in coolers/freezers equal to or less than 100 square feet (9.29 m²) in floor area.
2. In lieu of showing an audible notification appliance within a specific occupiable space on the plans, calculations may be provided showing that the alarm signals from the adjacent audible appliances will achieve a minimum of 80 decibels inside and throughout that space, where doors or other barriers between the space and the adjacent audibility device(s) are closed. Sound pressure levels shall be measured during system acceptance testing to verify the calculated space achieves a minimum of 80 dBA.
3. In sleeping areas required to be protected with low-frequency alarms, the 80 dBA minimum sound pressure provision is not required where a listed fire alarm device is not available to simultaneously achieve both the low-frequency signal and the 80 dBA minimum sound pressure.

Justification: This amendments correlates with NFPA 72 amendment, manufacturers products and state fire marshal regulations. The justification for this section is that the 80 decibel requirement has been an accepted standard throughout the State of Nevada for many years, and simplifies audibility testing. The state requirement is found in the fire marshal regulations. 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.

The first exception provides relief for small areas that are not normally occupied and are not occupied on a continuous basis over an extended period of time. The second exception provides a means of relief during plan review that allows verification upon performance testing during the acceptance inspection. The third exception provides relief for low frequency alarms as these appliances are not currently manufactured with the capability to produce the required 80 dB sound pressure.

Note: The 2018 IBC defines occupiable space as follows:

[BG] OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes or in which occupants are engaged at labor, and which is equipped with means of egress and light and ventilation facilities meeting the requirements of this code.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to required minimum sound pressure levels.

907.5.2.3.1

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

~~**Exception:** Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with not less than 20 percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing-impaired employee(s).~~

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 State Fire Marshal requirements NAC 477.283.

Items 4, 5, and 6 in the list are different than NAC 477.283 as these items have been in the past three local fire code adoptions [2006, 2009, 2012]. The Fire Code Committee retained items 4, 5 and 6 as they: i) Correlate with a national standard [2016 NFPA 72]; ii) To clarify the intent of the code by providing better definition; iii) Provide for consistence with regional with interpretation, and; iv) to eliminate conflicts in existing buildings where these have been applied.

SNBO Justification: Amendment required to correlate the provisions of a given national model code with other national model codes or prevailing State law as it pertains to required locations of visible alarm notification appliances.

907.5.2.2.6

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

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

Table 907.5.2.2.6.1

<u>STI Score</u>	<u>CIS Equivalent</u>	<u>Intelligibility</u>
<u>0.00</u>	<u>0.00</u>	<u>Bad</u>
<u>0.05</u>	<u>0.00</u>	<u>Bad</u>

<u>0.10</u>	<u>0.00</u>	<u>Bad</u>
<u>0.15</u>	<u>0.18</u>	<u>Bad</u>
<u>0.20</u>	<u>0.30</u>	<u>Bad</u>
<u>0.25</u>	<u>0.40</u>	<u>Bad</u>
<u>0.30</u>	<u>0.48</u>	<u>Bad</u>
<u>0.35</u>	<u>0.54</u>	<u>Poor</u>
<u>0.40</u>	<u>0.60</u>	<u>Poor</u>
<u>0.45</u>	<u>0.65</u>	<u>Poor</u>
<u>0.50</u>	<u>0.70</u>	<u>Fair</u>
<u>0.55</u>	<u>0.74</u>	<u>Fair</u>
<u>0.60</u>	<u>0.78</u>	<u>Fair</u>
<u>0.65</u>	<u>0.81</u>	<u>Good</u>
<u>0.70</u>	<u>0.85</u>	<u>Good</u>
<u>0.75</u>	<u>0.88</u>	<u>Good</u>
<u>0.80</u>	<u>0.90</u>	<u>Excellent</u>
<u>0.85</u>	<u>0.93</u>	<u>Excellent</u>
<u>0.90</u>	<u>0.95</u>	<u>Excellent</u>
<u>0.95</u>	<u>0.98</u>	<u>Excellent</u>
<u>1.00</u>	<u>1.00</u>	<u>Excellent</u>

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

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

Justification: A voice alarm communication system is only effective when those hearing the alarm understand and comprehend the instruction being provided. Voice instructions must be capable of being understood, clear and comprehensible. The acoustic environment and the communications channel must be addressed. Tones produced by voice alarm systems must comply with the audibility criteria while being able to understand what is being said over the voice alarm system is a function of intelligibility. Intelligibility design considers three main characteristics of the space under consideration: spatial acoustics, ambient environment, and occupant uses. The National Fire Protection Association Standard for Fire Alarm and Signaling Systems Code requires intelligibility and provides several methods for ascertaining intelligibility within the annex guidance material. This amendment stipulates the acceptable method for measuring and quantifying intelligibility.

SNBO Justification: Amendments required to clarify the intent of the codes, to provide for consistency in regional interpretation and application of the codes, and to correlate the provisions with the national standard NFPA 72 and prevailing State law as it pertains to the intelligibility of voice alarm communication systems.

907.6.4.1

907.6.4.1 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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to required locations for fire alarm control units and alarm annunciators.

907.6.6

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

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

1. Single- and multiple station smoke alarms required by Section 907.2.10.
- ~~2. Smoke detectors in Group I-3 occupancies.~~
- ~~3.2. Automatic sprinkler systems in one- and two-family dwellings.~~
3. Monitoring systems utilizing point-by-point monitoring.

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

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

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

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

Justification: Monitoring and the retransmission of signals to a supervising station impact fire department response and safety. Fire agencies have strict policies regulating monitoring. This amendment provides clear direction to supervising stations regarding signals to be monitored and the retransmission of the signals received. 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. This amendment eliminates the transmission of nuisance alarm signals to the local fire agencies. Verified fire alarm signals will receive a fire response per local agency policies.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to the required monitoring fire alarm signals and the retransmission requirements of these signals by the supervising station.

907.6.6.3

907.6.6.3 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 requiring multiple fire response teams to achieve system reset.

SNBO justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to required fire alarm control units and monitoring 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. Prior to implementation of this amendment (years ago) multiple systems were allowed to connect to the fire alarm equipment. One example of an impact of allowing this was the false transmission of a burglar alarm as a water flow alarm to fire dispatch. The resulting fire apparatus was met at the facility by armed burglars instead of a fire. Water is not the proper method of suppression for bullets. This amendment was developed as a result of this and similar issues, and it has resolved the problem.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to allowable connections to fire alarm systems.

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. Records of inspection, testing and maintenance shall be maintained.

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

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

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

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

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.

SNBO Justification: Amendment required to correlate the provisions of the nationally recognized standard NFPA 72 and prevailing State law as it pertains to the inspection, testing and maintenance requirements for fire alarm and fire detection systems.

907.11

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

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

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

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

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

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

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

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

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

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

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

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.

SNBO Justification: Amendments required to clarify the intent of the codes

908.3

908.3 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.

SNBO Justification: Amendment required to clarify the intent of the code and to provide for consistency in regional interpretation and application of the code as it pertains to signals produced by an emergency alarm systems.

909.5.3

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

Exceptions:

1. *Unchanged.*
2. *Unchanged.*
3. *Unchanged.*
4. *Unchanged.*
5. *Unchanged.*
6. *Unchanged.*
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 with amendment FLS18-011, to correlate the provisions of a given national model code with other national model codes or prevailing State law.

The primary concern is the difference between automatic-closing doors and self-closing doors, since the base code, as written, would not permit self-closing fire protection rated doors.

Historical justification for this same amendment in the 2006 IFC we find the following:

“Section 909.5.2 requires all doors in a smoke barrier that is incorporated into a smoke control system design to be automatic-closing. Section 3.3.7 of NFPA 80 (2007 edition) defines an “automatic-closing door” as “A door that normally is open but that closes when the automatic-closing device is activated.” Further, IBC Section 715.4.8.3 requires automatic-closing doors installed in smoke barriers to be automatic-closing by the actuation of smoke detectors installed in accordance with Section 907.3 (i.e., smoke detectors connected to the fire alarm system). Therefore, the IBC requires every door in any smoke barrier to have an associated smoke detector that is connected to the fire alarm system.

For buildings with a substantial number of smoke barriers and door openings in those smoke barriers, such as buildings that incorporate smoke control systems, the IBC requirement for all such door openings to be protected with automatic-closing fire doors results in a significant impact on the fire alarm system, not to mention a significant cost increase for the project. The proposed amendment would allow a significant number of normally closed doors in smoke barriers to be self-closing, which will reduce the cost impact associated with the locally-mandated smoke control systems.

The proposed amendment is consistent with the previous Southern Nevada amendments to Section 909.5.2 of the 2000 and 2006 editions of the IBC, and this allowance has proven to be a reasonable accommodation to owners and designers without negatively impacting life safety.”

SNBO Justification: IBC Correlation with amendment FLS18-011, to correlate the provisions of a given national model code with other national model codes or prevailing State law.

909.16

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

Justification: The fire fighter’s smoke control panel is for the fire service to use. The design, layout, operation and use of this panel is subject to approval and review of the fire code official. This change will ensure that the fire service needs for these panels is met.

SNBO Justification: Amendments required to address unique designs or systems not anticipated in the codes

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. ~~Verification of their installed condition shall be reported in the required final report.~~

Justification: Correlation with the IBC amendments, to correlate the provisions of a given national model code with other national model codes or prevailing State law.

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 amendments, to correlate the provisions of a given national model code with other national model codes or prevailing State law.

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 and Correlation with the IBC amendments, to correlate the provisions of a given national model code with other national model codes or prevailing State law.

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*.

SNBO Justification: Amendments required to clarify the intent of the codes

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, 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.

SNBO Justification: Amendments required to clarify the intent of the codes

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, 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.

SNBO Justification: Amendments required to clarify the intent of the codes

910.3.2.1

910.3.2.1 Sprinklered buildings. Where installed in buildings provided with an approved *automatic sprinkler system*, 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: Change to 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.

SNBO Justification: Amendments required to clarify the intent of the codes

912.1.1

912.1.1 Required sizes. Automatic sprinkler systems with a demand of up to 500 gpm shall be installed with a siamese with two 2½-inch. (65 mm) inlets. Automatic sprinkler systems with a demand greater than 500 gpm and an inlet pressure requirement not exceeding 175 psi shall be installed with a single, thread-less coupling consisting of one 5-inch (130 mm) Storz brand locking connection with a 30-45 degree downward deflection. When the

system demand exceeds 175 psi, the system shall include one 2½-inch (65 mm) inlet per every 250 gpm (956 L/min) demand. Modifications or alternate designs shall be *approved by the fire code official*.

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

Justification: FDC's are rarely utilized by fire suppression crews throughout the Las Vegas Valley. The SNFCC's prior amendments create a situation where most crews would opt out of using an FDC with more than two inlets and these installations are more costly than what is proposed. NFPA 13 § A.6.8.1 clearly states that "the purpose of the fire department connection is to supplement the water supply but not necessarily provide the entire sprinkler system demand. Fire department connections are not intended to deliver a specific volume of water." This amendment will standardize FDC sizes across the Las Vegas Valley and ensure that there is more than adequate ability to supplement any sprinkler system installation. NFPA 13 § 8.17.2.2 states when fire department connections are not required, and we should adhere to these requirements rather than try to find a way to "make it work."

The maximum working pressure of 5" hose carried by apparatus in southern Nevada has a maximum working pressure of 185 psi.

Standpipe systems require a meeting with the AHJ prior to design and any concerns for standpipe systems pressures need to be addressed during that meeting.

The height of these inlets is regulated by 2016 NFPA 14 section 6.4.6 "Fire department connections shall be located not less than 18 in. (457 mm) nor more than 48 in. (1219 mm) above the level of the adjoining ground, sidewalk, or grade surface". 2016 NFPA 13 Section 8.17.2.4.1.3 as amended, "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."

SNBO Justification: Amendments required to clarify the intent of the codes; Amendments required to provide for consistency in regional interpretation and application of the codes; Amendments required to address local fire response capabilities.

912.4.2

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

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

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.

SNBO Justification: Amendments required to address local fire response capabilities

913.1.1

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

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.

SNBO justification: Amendments required to address special uses and occupancies

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 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.

This amendment will result in a cost savings for the property owner. We could require a fire pump per building but rather than that approach we feel it is appropriate to allow a property owner to save money by consolidation of pumping into a common facility for multiple buildings on the same property. This consolidated pump site would then be serviced by at least one redundant pump. This has been our approach for several decades. However, if we go back to base code we can require a pump per building to comply with the base code which will result in higher costs to the property owner.

A common example would be an industrial park with multiple warehouses requiring fire pumps for ESFR sprinkler systems. A developer could effectively produce the water supply necessary from a single pump, with a redundant pump, instead of having a dedicated fire pump for each building. It should be noted that a single fire pump would be permitted to serve multiple structures on the same parcel constructed as a single building as allowed based on a construction type/height/area calculation.

Moreover, this amendment allows for one pump out of service for maintenance with the back-up pump providing the required flow and pressure. The lead time for replacement parts may cause a fire pump to be out of service for an extended duration. Having the back-up pump also avoids having a fire apparatus standby and / or protected lack of coverage eliminating the need of costly fire watches, operational cessation, prohibitions on hot works and other mitigation measures due to lack of fire protection.

SNBO Justification: Amendments required to address unique designs or systems not anticipated in the codes

913.2.3

913.2.3 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.

SNBO justification: Amendments required to clarify the intent of the codes

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 914.3.2.

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

1. ~~Open parking garages~~ in accordance with Section 406.5 of the International Building Code.
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by 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.

SNBO Justification: Amendments required to clarify the intent of the codes

914.3.2

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

Exception: Existing buildings.

914.3.2.1 Design options. Secondary water tanks that intercept the municipal water supply shall be designed to allow for continued fire protection when the secondary tank is taken out of service.

- a. For secondary water tanks supplying horizontal split case fire pump(s), or other fire pump(s) that can take a piped water supply, a bypass shall be installed around the secondary water tank to allow for temporary supply to the fire protection system during the repair of the secondary water tank.
- b. For secondary water tanks supplying vertical turbine pump(s), or other fire pump(s) that cannot accept piped supply, the secondary water supply shall be split into two separate tanks, each not less than ½ of the required water capacity, interconnected by pipe with sectional valves, with redundant pumping and automatic water filling capabilities. This tank arrangement shall be such as to permit one of the two tanks to be drained and have maintenance performed, while maintaining an operational fire protection system for the building served
- c. Alternate engineered solution that provides a water supply while the secondary tank is out of service approved by the fire code official

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 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 cannot be provided by other water uses, such as pools and water features.

Where the municipal water supply feeds first into a tank and then to the system, 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.

SNBO Justification: Amendments required to clarify the intent of the codes. Amendments required to provide for consistency in regional interpretation and application of the codes. Amendments required to address local fire response capabilities.

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 711 of the International Building Code, or both,~~
- ~~2. Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.~~

Justification: This amendment correlates with the IBC amendment to 404.3. 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.

Fire sprinkler systems should be required throughout buildings. Areas adjacent to the atrium may be the contributor to the smoke that is rising in the atrium. It is essential to limit the smoke being introduced into the atrium. Although the fire barrier allows for protection, the most effective protection from fire and fire products is a fire sprinkler system. With Exception No. 2, there is substantial evidence that fire sprinkler systems, in the correct configuration, are effective at heights exceeding 55 feet. Where the configuration of a building prohibits traditional fire sprinklers, other systems can be employed to provide suppression for any fire within the atrium.

NFPA 13 (2010), Section 8.1.1(1) requires sprinklers throughout the premises. Under certain conditions, NFPA 13 permits the omission of sprinklers in specific areas and spaces within a building (see Section 8.15 "Special Situations"). However, NFPA 13 does not permit the omission of sprinklers at the ceiling of an atrium when the atrium ceiling is more than 55 feet above the floor. If the building is required to be sprinklered throughout, and NFPA 13 does not permit the omission of sprinkler at the atrium ceiling, then Exception No. 2 should be deleted for 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 (> 55 feet) atrium under the Alternate Method process. However, by deleting Exception No. 2, the designers will be required to address each atrium on a case-by-case basis, which is not unreasonable

SNBO Justification: Amendments required to address special uses and occupancies

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.~~ Sprinklers are not required for stages 1,000 square feet (93 m²) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
- ~~2.3.~~ Sprinklers are not required within portable orchestra enclosures on *stages*.

Justification: This amendment correlates with IBC amendment to 410.6. 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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes.

914.8.3

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

~~**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: 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 914.8.3 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.

SNBO Justification: Amendments required to address special uses and occupancies

918

SECTION 918 SMOKE REMOVAL

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

918.2 Where Required.

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

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

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

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

Justification: This amendment provides direction for the smoke removal systems required in the International Building Code. The ventilation systems required are intended to ONLY to provide the fire department with an effective tool for the removal of smoke from high-rise buildings during post-fire salvage and overhaul operations. Status indicators and controls provide the firefighters' an interface to the smoke removal system. Local fire authorities have guidelines that for these interfaces to allow the firefighters to operate the fans. Smoke removal systems aid the fire service in removing smoke to verify that the fire is out and checking for extension. It is therefore essential that regular preventative maintenance is carried out to the required standards by competent personnel, who are familiar with the specification and strategy for the particular application.

SNBO Justification: Amendments required to address unique designs or systems not anticipated in the codes

Table 1006.2.1

**TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY				
OCC.	MAX. OCC. LOAD OF SPACE	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)
		Occupant Load		
		≤ 30	>30	
R-1	<u>20</u> 40	NP	NP	<u>125</u> ^a 75 ^a

All other portions of the Table and all Footnotes remain unchanged.

JUSTIFICATION:

The adoption of the amendment to increase the max. occupant load of R-1 units requiring only one exit to 20 may require that the common path of egress travel be increased in end unit conditions. The majority of these larger units are end units to take advantage of the possibility of increased exterior glazing within the unit. As defined, the common path of egress travel could be construed to extend past the first exit stair unless the stair is at the end of the building (past the units entry door), thereby eliminating the primary reason for having the unit at the end of the tower; capacity for increased exterior glazing.

Justification: IBC Correlation.

1010.1.8

1010.1.8 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.

SNBO Justification: IBC Correlation.

1029.6.2.3

1029.6.2.3 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 than 50 feet (15 240 mm) above the floor level and the use is restricted to low fire hazard uses.~~
- ~~2. Press boxes and storage facilities less than 1,000 square feet (93 m²) in area.~~
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 1029.6.2.3 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 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), to correlate the provisions of a given national model code with other national model codes or prevailing State law.

Chapter 11

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

Justification: This chapter requires that the fire code official to enforce retroactive provisions that are supported by state code adoption. A more stringent enforcement of retroactive provisions by a local government is prohibited by state law.

Chapter 11 is a retrofit/retroactive chapter. It requires retroactive construction of selective fire features in existing buildings. The Nevada State Fire Marshal has stricken Chapter 11 from adoption within the State.

Chapter 477 - State Fire Marshal. NRS 477.110 - Limitations on local ordinances requiring changes.

After May 15, 1981, the governing body of a local government may not adopt an ordinance requiring changes to existing structures to enhance the safety of occupants from fire if the ordinance is:

1. Less stringent than this chapter; or
2. More stringent than this chapter unless the governing body has sought and obtained approval of the ordinance from the State Board of Examiners.

(Added to NRS by 1981, 1569)

SNBO Justification: Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law

2304.2.4.1

2304.2.4.1

2304.2.4 Obstructions to view. Dispensing devices shall be in clear view of the attendant at all times. Obstructions shall not be placed between the dispensing area and the attendant.

2304.2.4.1 Video monitoring systems or other acceptable alternatives may be utilized when approved by the fire code official. Plans documenting camera and video monitor locations or other alternatives utilized shall be submitted to the fire code official for review and approval

JUSTIFICATION: This proposal is to add new section 2304.2.4.1 to codify the use of video monitoring systems or other acceptable alternatives when fuel dispensers are obstructed from view. Jurisdictions in Southern Nevada are seeing c-store design proposals that do not allow dispensing to be directly viewed. The current code language is not enforceable at large refueling operations where multiple dispensing islands are provided at angles beyond the normal visual field of vision for an attendant. Further obstructions to view may be added at any time a new marketing poster, sign or display is added, changed or modified.

The Commentary to the IFC has language suggesting the use of video monitoring systems may be acceptable, but without Code clarification some jurisdictions deem it to require an Alternate Means and Methods Request. Similar concepts have been introduced to the ICC national level for incorporation into the 2021 IFC.

Cost impacts are voluntary since the proposal does not require video monitoring system installations, but as an alternative to prescriptive requirements. Many fuel stations are already monitoring dispensers with video surveillance as a security measure.

SNBO Justification: Amendments required to clarify the intent of the codes.

2404.2

2404.2 Location of spray-finishing operations. Spray finishing operations conducted in buildings 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.

SNBO Justification: Amendments required to address special uses and occupancies

3103.3

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

Justification: Including “fairs” will confirm that a fair will be covered under an outdoor assembly event permit.

SNBO Justification: Amendments required to address special uses and occupancies; Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law; Amendments required to provide for consistency in regional interpretation and application of the codes.

3103.8.4

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

Justification: Membrane structures attached to buildings pose the same fire risk and have the same hazards related to structural integrity as those located on buildings and should be regulated accordingly.

SNBO Justification: Amendments required to address special uses and occupancies; Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law; Amendments required to provide for consistency in regional interpretation and application of the codes.

3104.2

3104.2 Flames propagation treatment. Before a permit is granted, the owner or agent shall file with the *fire code official* a certificate executed by and *approved* testing laboratory. The certificate shall indicate that the floor coverings tents, membrane structures and their appurtenances, which include, sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701 or California Title 19 Office of the State Fire Marshal. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701 or California Title 19 Office of the State Fire Marshal as applicable. The flame performance criteria shall be effective for the period specified by the permit. Alternatively, the material shall be treated with a flame retardant in an *approved* manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701 or California Title 19 Office of the State Fire Marshal. The flame propagation criteria shall be effective for the period specified by the permit.

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

Justification: California Title 19 is has greater or equivalent to NFPA 701 Method 2 (large scale test) but includes testing samples with accelerated aging in all instances. Many of the membrane materials submitted have California State Fire Marshal Office certificates of flame resistance. Allowing acceptance of materials evaluated per California Title 19 offers greater flexibility to the permit applicants without an impact to fire safety.

California Title 19 is a relevant test standard for the evaluation of bunting and combustible decorative materials.

See the comparison table below:

Textile Specification Comparison				
	CSFM Title 19 Small Scale	CSFM Title 19 Large Scale	NFPA 701 Test Method 1	NFPA 701 Test Method 2
Number of Samples	6	6	10	10
Sample Size	2.5" x 12.5"	5" x 7'	Approx. 6" x 16"	Approx. 5" x 47"
Angel of specimen	Vertical	Vertical	Vertical	Vertical
Ignition Source	Gas Burner	Gas Burner	Gas Burner	Gas Burner
Length of Exposure to Ignition Source	12 Seconds	2 Minutes	45 Seconds	2 Minutes
Accelerated Weathering and/or Leaching?	Yes	Yes	Yes, if claims are made to durability to cleaning or weathering	Yes, if claims are made to durability to cleaning or weathering
Properties Measured	<ul style="list-style-type: none"> • After Flame • Char Length 	<ul style="list-style-type: none"> • After Flame • Char Length 	<ul style="list-style-type: none"> • % of Weight Loss • Burning Residue 	<ul style="list-style-type: none"> • After Flame • Char Length • Burning Residue

Also see: <http://www.necpa.org/blog/flammability-requirements-on-the-rise>

CSFM Title 19 Large Scale and NFPA 701 Test Method 2 are used for textiles that exceed 21 ounces per square yard of material that is typical of material that would be used for a membrane structure.

SNBO Justification: Amendments required to clarify the intent of the codes; Amendments required to provide for consistency in regional interpretation and application of the codes.

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.

SNBO Justification: Amendments required to clarify the intent of the codes

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.

SNBO Justification: Amendments required to address local fire response capabilities

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.

SNBO Justification: Amendments required to address local fire response capabilities

3903.3

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

Justification: Flammable vapors are potentially being released during the extraction process and using a spray booth is prudent and proven method of handling flammable vapors.

This amendment has a potential cost savings as building a spray room is costlier than a lab hood.

SNBO CRITERIA: Amendments required to address special uses and occupancies

3905.1.3

3905.1.3 Operation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visual alarm signals in the extraction room.
2. Deactivation of all heating systems located in the extraction room.
3. Activation of the mechanical ventilation system, where the system is interlocked with gas detection.
4. Mechanical ventilation rate shall be such that the air velocity over the cross-section of the extraction room in the direction of air flow is not less than 100 linear feet/minute.

Justification: Flammable gases are being used during the extraction process and using the ventilation rate approved for Spray booths is prudent and proven.

This amendment has a potential cost savings as building a spray room is costlier than a lab hood.

SNBO CRITERIA: Amendments required to address special uses and occupancies

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.

Exceptions:

1. Piping for inlet connections designed to prevent backflow.
2. Piping for pressure relief devices.

6. New and existing remote tank filling connections shall be in accordance with this subsection 6.

6.1 Permanent signs clearly indicating the tank contents associated with each connection port shall be displayed at the remote filling station. Signage shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size color and lettering shall be approved.

6.2 The transfer hose connection for liquids that have a pH of 6.0 or less (acidic) shall be equipped with female "Cam-lock" type fittings or other mechanical connection means approved by the fire code official, sized appropriately.

6.3 The transfer hose connection for liquids that have a pH of 8.0 or greater (basic) shall be equipped with male "Cam-lock" type fittings or other mechanical connection means approved by the fire code official, sized appropriately.

Justification:

Item 6 of IFC Section 5003.2.2.1 addresses requirements for tank filling operation connections preventing unwanted filling into the wrong tanks where properties have both acids and bases, which has occurred in the valley multiple times. The section is amenable to both suppliers and operators so that hazardous materials responses to preventable accidents are mitigated. It 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. History has demonstrated that liquids can be transferred into the wrong tank resulting in significant building occupant exposure to reaction products.

SNBO Justification: Amendments required to address special uses and 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.

SNBO Justification: Amendments required to address special uses and occupancies

5305.11

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

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

Justification: The purpose of this proposal is to provide a methodology to calculate the maximum allowable carbon dioxide used for temporary indoor theatrical fog effects. Theatrical Fog Effects are released into the breathing space of performers and members of the audience during shows. This methodology enables the calculation of the maximum allowable amount of carbon dioxide that can be used based on site specific criteria.

Supporting Information:

- A) The variables in this calculation method are:
 - a. Stage area
 - b. Venue volume
 - c. Venue exhaust rate
 - d. Length of Show
- B) The following items drive the calculation policy:
 - a. This methodology has not used the audience area as a portion of the area subject to CO₂. This does not mean that no CO₂ drifts into the audience area, but that the audience area for calculation is handled as a no exposure area.
 - b. CO₂ (density = 1.52) is much heavier than air and will readily settle in low areas. As such the calculation policy assumes that the CO₂ will be close to the floor and will not be evenly mixed with the entire volume of air in the room.
 - c. For the purposes of calculation, the CO₂ will be assumed to be within 10' of the floor (or stage).
 - d. The average breathing height utilized under OSHA sample collection for breathing hazards is 5' above floor. If 5' is the average, the concentration gradient can be defined as the space from 0' to 10' above the floor or stage.

This amendment Simply quantifies amounts of CO₂ permitted for temporary fog effect uses to prevent overexposure to CO₂.

SNBO Justification: Amendments required to address unique designs or systems not anticipated in the codes.

5306.6

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

1. Project name, street address and owners name.
2. Contractor name, address, phone number, license numbers (City, State Contractor and State Fire Marshal).
3. Signature of the licensee (contractors Master or Qualified Employee) or seal and signature of a Professional Engineer licensed in the state of Nevada.
4. Code edition of standards used in the design.
5. System classification.
6. When used - gas type, container size and quantity.
7. Symbol legend with equipment description (manufacture's name and model number) and mounting description (surface, semi-flush, flush, and exterior).
8. Site plan.
9. Floor plan drawn to an indicated scale (1/8" minimum) on sheets of a uniform size showing:
 - a. Point of compass (north arrow).
 - b. Walls, doors, windows, openings, stairs, elevators, passageways, high-piled storage racks, etc., as applicable to depict the facility.
 - c. Room use identification labels.
 - d. Gas, air and vacuum piping distribution systems, manifolds, sizes and material types. Piping hangers and slopes.
 - e. Valves and valve boxes, outlets, gages and other components.
 - f. Electrical warning systems (local and master alarm panels), conductor/conduit routing and size, power panel and circuit connection.
 - g. Key plan.
 - h. Compressor inlet location and vacuum exhaust outlet location.
 - i. For interior gas supply rooms provide construction fire ratings, ventilation and fire sprinkler information.
10. Product data submittal including a cover index sheet listing products used by make and model number, manufacturer data sheets (highlighted or marked) and listing information for all equipment, devices, and materials.
11. Design number and detail of penetration fire stop system when required.
12. Verification & inspection requirements.
13. Name of independent medical gas testing agency to certify the system.
14. Any additional information determined necessary.

Justification: This is amendment provides guidance on required items for application of a compressed gas permit associated with medical gas systems.

SNBO Justification: Amendments required to clarify the intent of the codes

5306.7

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

Justification: This is amendment provides guidance for the testing of medical gas systems.

SNBO Justification: Amendments required to address special uses and occupancies

5307.3.2

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

1. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m³).
2. Activates an audible and visible alarm within the room or immediate area where the system is installed and stops the flow of carbon dioxide into the piping system upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m³).

Justification: If a carbon dioxide leak resulting in a concentration of 30,000 ppm occurs not only should the audible and visual alarms be activated but the source of the CO₂, the insulated container should be automatically shut off.

These requirements add a logical step to the alarm sequence to mitigate a potential asphyxiation emergency.

SNBO Justification: Amendments required to address unique designs or systems not anticipated in the codes.

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 fireworks as allowed in Section 5604.
2. Manufacturer, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided such fireworks comply with NFPA 1124, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR, Parts 100-185, as applicable for consumer fireworks.
5. The possession, storage, use, handling, and sale of consumer safe and sane fireworks in accordance with the current "Fire Prevention Association of Nevada Guidelines for Fireworks".

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 a long standing guideline as well as a dedicated team of professionals that test these products and work with vendors every year.

SNBO Justification: Amendments required to address special uses and occupancies

5601.2.2

5601.2.2 Sale and retail display. ~~Persons shall not construct a retail display nor offer for sale explosives, explosive materials or 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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the 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 105.1.7.1 in the amount of \$5,000,000.00, for the purpose of the payment of all damages to persons or property that arise from, or are caused by, the conduct of any act authorized by the permit upon which any judicial judgment results. The *fire code official* is authorized to specify a greater ~~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 5-million certificate of insurance for blasting activities.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

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 inquiries. 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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address local fire response capabilities

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

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

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

Justification: These requirements are necessary to correct a previous amendment to the code, and address the need for security of all explosives storage sites. At this time the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE) relies on local jurisdiction to implement security requirements. Several jurisdictions throughout the United States already require security systems, manned security guards, or video surveillance systems for explosives storage sites. This amendment will allow for various systems to be used instead of limiting it to one type of system. Record keeping shows who was in and out of a magazine, as well as how much product is stored on site. A detailed inventory is required to determine if any products are missing or unaccounted for, and to ensure that in the event of an emergency fire and emergency service crews can determine the proper course of response.

SNBO Justification: Amendments required to address special uses and occupancies

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 phosphoric 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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

5607.3

5607.3 Blasting in congested areas. Where 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 being thrown.

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

1. All blasts shall be monitored at the nearest structure by a third-party engineering firm. Utilities or other critical infrastructure within 300 feet of the blast area shall be monitored by a third-party engineering firm. Such monitoring shall be done by a seismologist using a certified, annually calibrated, seismic monitor that shall be capable of measuring blast-induced vibration and blast-induced sound levels.
2. A minimum of two seismographs shall be used to obtain data from each blast or as required by the fire code official.
3. The maximum ground-borne vibrations shall not exceed a single component peak particle velocity (vector sum) of 0.5 inches per second at the nearest structure.
4. For utilities and other critical infrastructure within 300 feet of the blast-area, the maximum ground-borne vibrations shall not exceed the limits as set forth by the specific utility purveyors or critical infrastructures engineering department. A written approval from the utility purveyor or critical infrastructure detailing these limits shall be provided to the fire code official prior to any blasting activities.
Exception: If the utility or critical infrastructure purveyor does not provide written approval within a reasonable period of time, as determined by the fire code official, the applicant may request permission to submit a blast plan designed so that the maximum ground-borne vibrations shall not exceed a single component peak particle velocity (vector sum) of 0.5 inches per second at the nearest utility or other critical infrastructure.
5. The maximum air blast shall not exceed 120 dB at the nearest structure.
6. Monitoring results shall be reported to the fire code official within 48 hours via e-mail.
7. The blasting contractor shall provide a minimum of 72 hours prior written notice of blasting activities and project duration to all residences, property owners, businesses, and public uses within 2500 feet of the blasting area. The manner, form, and content of any such notice shall be subject to the approval of the fire code official.
8. For utility notification, see 5607.5
9. The blasting contractor shall notify the fire code official and fire department dispatch by telephone a minimum of two (2) hours prior to each blast, and immediately following each blast.
10. The blasting contractor shall provide for pre-blast and post-blast surveys of all structures, utilities, and other critical infrastructures within 300 feet of the blast area, or when otherwise required by condition

of the fire code official. These surveys must be completed by a third-party engineering firm at no cost to the owner.

11. A traffic and access control plan shall be provided when blasting activities are conducted within 100 feet of any public roadway, or when required by the fire code official. The plan shall include warning signage, flagging, temporary road closure, and detour routes. This plan may be subject to the approval of the local law enforcement agency.
12. The blasting contractor shall be responsible for removing and cleaning up any debris from the blast site and adjacent properties.

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

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

Justification: These requirements are necessary to fill a gap in the code and ensure that the utilities and other critical infrastructure receive the same protection as structures do during blasting activities. Most utilities purveyors and other critical infrastructures already have established limits in place. Critical infrastructure is readily defined by the Department of Homeland Security (DHS) to include chemical and hazardous materials installations and piping systems, agriculture and food, transportation, etc. It is intended to catch items that may not otherwise be captured as a structure or utility, but still may be effected by ground-borne vibrations from blasting activities. These items may include underground fuel transmission lines, tank farms, freeway overpasses, bridges, or agricultural storage bins.

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.

The exception allows the fire code official flexibility to meet the needs of unique circumstances and specific project needs. The term reasonable was evaluated and deemed appropriate for this requirement due to the nature of some utilities. Some public utilities are more efficient at providing responses due to the nature of the activity and familiarity. Others may be intentionally slow. The exception allows contractors to move forward with time-sensitive projects with more stringent requirements.

SNBO Justification: Amendments required to address special uses and occupancies and Amendments required to provide for consistency in regional interpretation and application of the codes

5607.4

5607.4 Restricted hours. Surface 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.

SNBO Justification: Amendments required to address special uses and occupancies and Amendments required to provide for consistency in regional interpretation and application of the codes

5607.5

5607.5 Utility Notification. ~~Where 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 can not 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.

SNBO Justification: Amendments required to address special uses and occupancies and Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to clarify the intent of the codes

5607.13

5607.13 Firing Control Pre-blast procedures. ~~A blast shall not 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.

SNBO Justification: Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to address special uses and occupancies

5607.14

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

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

SNBO Justification: Amendments required to address special uses and occupancies

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*.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to address special uses and occupancies

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 officials work in coordination with them when a tank is removed but the responsibility to coordinate and comply with their requirements is the contractor's.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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. [JURISDICTION TO SPECIFY].~~

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.

SNBO Justification: Amendments required to address local climatic conditions and Amendments required to address special uses and occupancies

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

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.~~
~~[JURISDICTION TO SPECIFY]~~

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.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

6104.2

6104.2 Liquefied petroleum gas storage containers. Maximum capacity within established limits. Within the limits established by law restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L). ~~[JURISDICTION TO SPECIFY]~~

Exception: In particular installations, this capacity limit shall be determined by the fire code official, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed LP gas containers, degree of fire protection to be provided and capabilities of the local fire department. 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. The main section has been reverted back to base Code because Amendment 105.6.27 establishes that quantities in excess of 30 gallons require a permit and when the permit is applied for, indicates that planning and zoning approval is required irrespective of amount. The attendees at the HazMat committee agreed that 2,000 gallons or less liquid capacity was a

reasonable quantity for which fire prevention could issue a permit. Beyond that, planning and zoning approval is required.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

80

Chapter 80 REFERENCED STANDARDS, NFPA,

54-18 National Fuel Gas Code

140-18 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.

SNBO Justification: Amendments required to correlate the provisions of a given national model code with other national model codes or prevailing State law.

Appendix B

Table B105.1(1)

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

FIRE FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No Automatic sprinkler System	1,000	1
3,601 and greater	No Automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0-3,600	Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code	500	1/2
3,601 and greater	Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code	1/2 value in Table B105.1(2)	1

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

Justification: This amendment maintains the same criteria that the utility purveyors and the fire departments have used over the past 25+ years for determining the amount of water (fire flow) needed to fight a fire. This amendment takes the code back to what is currently enforced in the 2012 Edition of the International Fire Code as locally amended and was previously enforced in past fire code adoptions. The automatic sprinkler system column and rows in Table B105.1(1) are deleted to maintain the current minimum water requirements for residential occupancies and subdivisions.

SNBO Justification: Amendments required to address local fire response capabilities

Table B105.2

Table B105.2
REQUIRED FIRE FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the International	<u>High-rise Buildings: 75%</u>	Duration in Table B105.1(2) at

Fire Code	<u>All Other Buildings: 50%</u> 25% of the value in Table B105.1(2) ^a	the reduced flow rate
Section 903.3.1.2 of the International Fire Code	<u>High-rise Buildings: 75%</u> <u>All Other Buildings: 50%</u> 25% of the value in Table B105.1(2) ^{ab}	Duration in Table B105.1(2) at the reduced flow rate

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

- a. The reduced fire flow shall be not less than ~~1,500~~ 1,000 gallons per minute
- ~~b. The reduced fire flow shall be not less than 1,500 gallons per minute~~

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.

SNBO Justification: Amendments required to address local fire response capabilities

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. Two connections to the same main shall be permitted provided that the main is valved such that an interruption can be isolated.

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

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

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

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

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

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

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

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

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

Section C106 **Construction Operations**

C106.1 Construction Hydrants. Hydrants shall be provided for construction in accordance with Section 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. Section C104.1 has an added requirement for an isolation valve. The intent of requiring two sources of water is to enhance the reliability of the supply to a larger development such as a residential subdivision of commercial development. The dual supply is often designed with two feeds with minimal separation connected to the same water main with a gate valve installed at a point between the two feeds. This arrangement does not meet the intent of the code amendment since a pipe break in the vicinity of the two feeds can disable both. The requirement of a valve between the two feeds enhances reliability and encourages the designers to use two independent and separate water sources when they are available.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

Appendix O

Appendix O Proprietary Supervising Station Facilities

Section O101

General

O101.1 Scope. Proprietary supervising station facilities (self-monitoring facilities) shall meet all of the requirements of this appendix.

O101.2 Permit Required. The proprietary supervising station facility shall maintain an annual operational permit.

Section O102

Site Requirements

O102.1 Location. The proprietary supervising station shall be located in a property's Fire Command Center, or other approved location.

O102.1.1 Equipment. The approved location shall have at a minimum the following items:

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

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

Section O103

Personnel

O103.1 Qualifications. Proprietary supervising stations shall be operated by trained personnel in constant attendance who are responsible to the owner of the protected property.

O103.1.1 Evidence of training. Annually the applicant shall certify in writing to the *fire code official* that all authorized personnel have received training in the recognition and proper handling of alarm signals. Evidence of annual training for each authorized personnel shall be provided when requested by the *fire code official*.

O103.2 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 O104 for the facility.

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

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

Section 0104

Standard Operating Procedures

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

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

Section 0105

Disposition of Signals

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

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

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

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

Section 0106

Record-Keeping

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

1. The investigating person's name.
2. The device address.
3. The type of alarm.
4. The date and time of receipt of the fire alarm signals.
5. The cause and disposition of the fire alarm signals.

SNBO Justification: Southern Nevada has very large and unique facilities that desire to provide self-monitoring. This appendix was created as a result of this desire. The requirements set forth in this appendix are a combination of the requirements from NFPA 72, the IFC, local fire agency requirements and local past practices.

Appendix P

Appendix P
FIRE PROTECTION SYSTEMS – IMPAIRMENTS AND SYSTEMS OUT OF SERVICE**Section P101**
IMPAIRMENT PROCEDURES

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

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

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

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

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

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

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

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

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

- 1) Be capable of walking the building continuously during the shift. The fire watch shall walk over all assigned floor areas, including all exits from the floor areas assigned. Where the fire watch needs to take a break, another fire watch person shall cover the area during the break.
- 2) Be equipped with a bullhorn, flashlight, and cellular phone
- 3) Be capable of assisting employees and building occupants to evacuate the building in an emergency situation while utilizing the flashlight to illuminate the means of egress. This activity may be required

within the assigned fire watch area, or in assistance to other fire watch personnel in other fire watch areas in the building.

- 4) Be capable of calling emergency services by dialing 911 in case of fire. Upon discovery of fire, fire watch personnel shall first call 911, and then advise all other fire watch personnel of the emergency in order to obtain their assistance in notifying and evacuating employees and building occupants.

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

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

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

P102

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

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

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

<u>Impairment Description</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Impairment Duration</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
Fire Pump (standalone)	<u>1</u>	<u>≤ 3 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 3 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 2 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 2 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 1 hour</u>	<u>Y</u>	<u>N</u>
		<u>> 1 hour</u>	<u>Y</u>	<u>Y</u>
Fire Pump with back-up fire pump	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>

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

<u>Impairment Description</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Impairment Duration</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
	<u>6 or more</u>	<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
		<u>≤ 2 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 2 hours</u>	<u>Y</u>	<u>Y</u>
<u>Water Spray Fixed Systems (NFPA 15)</u>	<u>NA</u>	<u>≤ 8 hours</u>	<u>N</u>	<u>N</u>
		<u>> 8 hours</u>	<u>Y</u>	<u>Y</u>
<u>Foam-water system</u>	<u>1</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
<u>Kitchen exhaust hood and duct extinguishing system</u>	<u>NA</u>	<u>≤ 2 hours</u>	<u>N</u>	<u>N</u>
		<u>> 2 hours</u>	<u>Y</u>	<u>Y</u>
<u>Clean-agent (with sprinkler system inside the space)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>Y</u>	<u>N</u>
<u>Clean-agent (without sprinkler system inside the space)</u>	<u>1</u>	<u>≤ 6 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 6 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 2 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 2 hours</u>	<u>Y</u>	<u>Y</u>
<u>Water storage tank (including pools used as tanks) - with redundant water mains</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>N</u>	<u>Y</u>
<u>Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 3 hours</u>	<u>N</u>	<u>N</u>
		<u>> 3 hours</u>	<u>N</u>	<u>Y</u>
<u>Water storage tank (including pools used as tanks) - without redundant water mains and tank</u>	<u>1</u>	<u>≤ 3 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 3 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 2 hours</u>	<u>Y</u>	<u>N</u>

<u>Impairment Description</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Impairment Duration</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
<u>acts as break tank for primary supply</u>	<u>6 or more</u>	<u>> 2 hours</u>	<u>Y</u>	<u>Y</u>
		<u>≤ 1 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 1 hours</u>	<u>Y</u>	<u>Y</u>
<u>Obstructions in water supply – Lack of Flushing/MIC</u>	<u>1</u>	<u>≤ 8 hours</u>	<u>N</u>	<u>N</u>
		<u>> 8 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
<u>Fire department access (fire hydrant, fire command center, fire pump and FDC access)</u>	<u>1</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>

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

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

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

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

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

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

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

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

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

<u>Impairment (Water-Based Systems, Groups B, F, M and S)</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Estimated Repair Time</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
Fire Pump	<u>1</u>	<u>≤ 10 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 2 hour</u>	<u>Y</u>	<u>N</u>

<u>Impairment (Water-Based Systems, Groups B, F, M and S)</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Estimated Repair Time</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
		<u>> 2 hour</u>	<u>Y</u>	<u>Y</u>
<u>Fire Pump with back-up fire pump</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
<u>Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 8 hours</u>	<u>N</u>	<u>N</u>
		<u>> 8 hours</u>	<u>N</u>	<u>Y</u>
<u>Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 2 hour</u>	<u>Y</u>	<u>N</u>
		<u>> 2 hour</u>	<u>Y</u>	<u>Y</u>
<u>Underground fire service main out of service – redundant main and tank</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 8 hours</u>	<u>N</u>	<u>N</u>
		<u>> 8 hours</u>	<u>N</u>	<u>Y</u>
<u>Underground Supply Out of Service (No secondary water supply)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 1 hour</u>	<u>Y</u>	<u>N</u>
		<u>> 1 hour</u>	<u>Y</u>	<u>Y</u>
<u>Underground Supply Out of Service (built-in secondary water supply)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 2 hours</u>	<u>N</u>	<u>N</u>
		<u>> 2 hours</u>	<u>N</u>	<u>Y</u>
<u>Waterflow switch not functional (system still operational)</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>Y</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 3 hours</u>	<u>N</u>	<u>N</u>
		<u>> 3 hours</u>	<u>Y</u>	<u>N</u>

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

<u>Impairment (Water-Based Systems, Groups B, F, M and S)</u>	<u>Building/ Location Height – Stories Above Grade</u>	<u>Estimated Repair Time</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
<u>acts as break tank for primary supply</u>	<u>6 or more</u>	<u>> 3 hours</u>	<u>Y</u>	<u>Y</u>
		<u>≤ 1 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 1 hours</u>	<u>Y</u>	<u>Y</u>
<u>Obstructions in water supply – Lack of Flushing/MIC</u>	<u>1</u>	<u>≤ 8 hours</u>	<u>N</u>	<u>N</u>
		<u>> 8 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 6 hours</u>	<u>N</u>	<u>N</u>
		<u>> 6 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
<u>Fire department access (fire hydrant, fire command center, fire pump and FDC access)</u>	<u>1</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>N</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>

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

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

<u>Impairment (Fire Alarm System, Groups B, F, M and S)</u>	<u>Building Height - Stories</u>	<u>Estimated Repair Time ¹</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
	<u>2-5</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 3 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 3 hours</u>	<u>Y</u>	<u>Y</u>
<u>Strobe power supply is down</u>	<u>1</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>N</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>N</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>N</u>	<u>Y</u>
<u>Audio Panel is down</u>	<u>1</u>	<u>≤ 5 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>Y</u>
	<u>2-5</u>	<u>≤ 5 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>Y</u>
	<u>6 or more</u>	<u>≤ 4 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 4 hours</u>	<u>Y</u>	<u>Y</u>
<u>Single detection circuit is down</u>	<u>1</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 5 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>Y</u>
<u>Single alarm circuit is down</u>	<u>1</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 5 hours</u>	<u>N</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 5 hours</u>	<u>Y</u>	<u>N</u>
		<u>> 5 hours</u>	<u>Y</u>	<u>Y</u>
<u>Single detection device not operational</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
<u>Single Notification Device not operational</u>	<u>1</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
	<u>2-5</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
	<u>6 or more</u>	<u>≤ 10 hours</u>	<u>N</u>	<u>N</u>
		<u>> 10 hours</u>	<u>Y</u>	<u>N</u>
<u>Monitoring Panel not operational (fire sprinkler and fire alarm</u>	<u>1</u>	<u>≤ 24 hours</u>	<u>N</u>	<u>N</u>
		<u>> 24 hours</u>	<u>Y</u>	<u>Y</u>

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

<u>Impairment (Fire Alarm System, Groups B, F, M and S)</u>	<u>Building Height - Stories</u>	<u>Estimated Repair Time ¹</u>	<u>Fire Watch Req'd</u>	<u>Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3</u>
<u>Fire fighter communication systems (fire phones and radio systems)</u>	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.

Justification: The purpose of this amendment is to provide guidance when systems become impaired. The tables address differences in occupancy and building height, and line out fire watch and notification procedures for a variety of different types of system impairments. When the tables require notification to the AHJ, several options for mitigation are provided, such as fire watch, cessation of operation, fire engine standby, or partial/total building evacuation.

SNBO Justification: Amendments required to provide for consistency in regional interpretation and application of the codes

NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

NFPA 13

3.3.16

3.3.16* Limited Combustible (Material). Refers to a building construction material not complying with the definition of noncombustible material that, in the form in which it is used, has a potential heat value not exceeding 3500 Btu/lb (8100 kJ/kg), where tested in accordance with NFPA 259, and includes either of the following: (1) materials having a structural base of noncombustible material, with a surfacing not exceeding a thickness of 1/8 in. (3.2 mm) that has a flame spread index not greater than 50; or (2) materials, in the form and thickness used, having neither a flame spread index greater than 25 nor evidence of continued progressive combustion, and of such composition that surfaces that would be exposed by cutting through the material on any plane would have neither a flame spread index greater than 25 nor evidence of continued progressive combustion, when tested in accordance with ASTM E84, *Standard Test Method of Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard Test Method of Surface Burning Characteristics of Building Materials*.

3.3.16* Limited-Combustible (Material). Deleted in its entirety throughout this standard. This term shall have no ordinary accepted meaning as noted in Section 3.1 as it relates to the installation of limited-combustible material for the installation of sprinkler systems. This deletion shall apply throughout this standard and throughout all referenced codes and standards as stated in the International Fire Code Section 102.7 and all applicable standards or requirements that are not set forth in this code as stated in the International Fire Code Section 102.8 when involving sprinkler systems.

JUSTIFICATION: The Southern Nevada Fire Code Committee makes numerous amendments that are specifically to delete this term only. By deleting the term and its meaning throughout the standard, we can eliminate numerous amendments.

5.3.2.1

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 used 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 305), 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. Note: AWWA changed the pressure classification of C900 pipe. Per the Foreword of AWWA C900-07, Section IV.3: "The pressure classes were revised from 100, 150, and 200 psi ... to 165, 235, and 305 psi ... respectively." Underground piping connected to a fire pump or a fire department connection (FDC) shall have a minimum working pressure of 200 psi (Class 305).

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 (1/4 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 a permanent and readable sign.

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.

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.

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.

7.2.6.3

7.2.6.3 Air Supply

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

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

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

JUSTIFICATION: Joe Noble, the Chair of the NFPA 13 technical committee on sprinkler system installation criteria informed the committee that the intent of the section 7.2.6.3.1 was to have permanently installed compressors. (Including securing them in place and hardwiring them). In the field, inspectors have reported finding compressors unplugged and missing. Hardwiring and securing the compressors in place will help insure that the compressed air will be available at all times as stated in the standard. It's my understanding that most jurisdictions in the valley have been using similar interpretations but could not justify the requirement due to the vagueness of the code reference.

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.

7.9.2.2

7.9.2.2 ~~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.

7.9.3.1

7.9.3.1 Unless the requirements of 7.9.3.2 or 7.9.3.4 are met, exhaust ducts shall have one sprinkler or automatic spray nozzle located at the top of each vertical riser, ~~and at the midpoint of each offset, and an additional sprinkler shall be installed within the duct at 20-foot intervals on vertical risers where not otherwise provided with sprinklers due to offsets in buildings over two stories.~~

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.

7.9.9

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

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 Floor Control Valve Assemblies.

8.2.4.1* 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.

8.2.4.2 The floor control valve, check valve, main drain valve, and flow switch required by ~~8.2.4.1~~ ~~8.16.1.5.3~~ 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.~~

8.2.4.3 ~~The floor control valve, check valve, main drain valve, and flow switch required by 8.16.1.5.3 shall not be required where the total area of all floors combined does not exceed the system protection area limitations of 8.2.1.~~

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 IFC adoption.

8.2.5

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

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 serve multiple buildings.

8.3.3.1

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

- (1) Quick-response type as defined in 3.6.4.8
- (2) Residential sprinklers in accordance with the requirements of 8.4.5
- (3) Quick response CMSA sprinklers
- (4) ESFR sprinklers
- (5) Standard response sprinklers used for modifications or additions, within the existing compartment, to existing ~~light hazard~~ systems equipped with standard response sprinklers
- (6) 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 (5) and (6) are to indicate that items (5) and (6) apply to all occupancies in the charging statement, to include light hazard occupancies, casinos, and exhibition areas.

8.7.5.3.2

8.7.5.3.2 Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide such as ducts, decks, open grate flooring, cutting tables, and overhead doors.

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

Justification: Since the vast majority buildings fall under NFPA 13R as a base requirement when not modified by local amendments, the following NFPA 13R commentary is being proposed as justification. "Paragraph 7.3.2.1 addresses the practicality and cost of installing additional sprinklers in garages to minimize obstructions caused by overhead garage doors. While in the up position, the garage door will likely cause an obstruction to a sprinkler located above the door. However, garage doors are usually left in the closed position for the types of residential occupancies addressed by NFPA 13R. The likelihood of a deadly fire occurring in the garage while the door is in the open position falls within the level of protection concept employed by NFPA 13R

Additionally, since garage doors are residential type, this would place sidewall fire sprinklers at heights below 7 feet. This requirement would cause potential damage to the fire sprinkler head due to being struck by the parking vehicle and expose the piping to unconditioned areas.

8.8.5.3.2

8.8.5.3.2. Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide such as ducts, decks, open grate flooring, cutting tables, and overhead doors.

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

Justification: Since the vast majority buildings fall under NFPA 13R as a base requirement when not modified by local amendments, the following NFPA 13R commentary is being proposed as justification. "Paragraph 7.3.2.1 addresses the practicality and cost of installing additional sprinklers in garages to minimize obstructions caused by overhead garage doors. While in the up position, the garage door will likely cause an obstruction to a sprinkler located above the door. However, garage doors are usually left in the closed position for the types of residential occupancies addressed by NFPA 13R. The likelihood of a deadly fire occurring in the garage while the door is in the open position falls within the level of protection concept employed by NFPA 13R

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8.9.5.3.2 Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide such as ducts, decks, open grate flooring, cutting tables, and overhead doors.

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

Justification: Since the vast majority buildings fall under NFPA 13R as a base requirement when not modified by local amendments, the following NFPA 13R commentary is being proposed as justification. "Paragraph 7.3.2.1 addresses the practicality and cost of installing additional sprinklers in garages to minimize obstructions caused by overhead garage doors. While in the up position, the garage door will likely cause an obstruction to a sprinkler located above the door. However, garage doors are usually left in the closed position for the types of residential occupancies addressed by NFPA 13R. The likelihood of a deadly fire occurring in the garage while the door is in the open position falls within the level of protection concept employed by NFPA 13R

Additionally, since garage doors are residential type, this would place sidewall fire sprinklers at heights below 7 feet. This requirement would cause potential damage to the fire sprinkler head due to being struck by the parking vehicle and expose the piping to unconditioned areas.

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 more than 10.5 ft (3.2 m) when tested in accordance with ASTM E84, Standard Test Method of Surface Burning Characteristics of Building Materials, or ANSI/UL 723, Standard for Test for 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, 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.

8.15.4.1

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.

8.15.7.1

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 canopies, roofs, porte-cocheres, balconies, decks, and similar projections are constructed entirely with materials that are noncombustible, ~~limited combustible, or fire retardant-treated wood as defined in NFPA 703, or where the projections are constructed utilizing a noncombustible frame, limited combustibles, or fire retardant-treated wood with an inherently flame resistant fabric overlay as demonstrated by Test Method 2 in accordance with NFPA 701 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 160³ ft (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 (5.1 m²) 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. Unless sprinklers are required by 8.15.8.1.2 or 8.15.8.1.3, sprinklers shall not be required in bathrooms that are located within dwelling units of hotels and motels, that do not exceed 55 ft² (5.1 m²) 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.

8.15.8.1.1.1

8.15.8.1.1.1 ~~Sprinkler protection shall not be required in separate rooms that contain solely a toilet fixture, that contain no counters, shelving, closet doors, or other fixtures, and that have a maximum area of 55 ft² (5.1 m²). Such rooms shall be surrounded by walls and doors that completely enclose the room.~~

Justification: Base code allows the omission of sprinklers in bathrooms that do not exceed 55 ft² 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 any shower enclosure or tub. There is concern with the definition of "limited combustible", as well as the amount of combustible material presented with shower/tub enclosures, shelving, closet doors, etc. This amendment allows the omission of sprinklers in bathrooms of 55 ft² or less that do not contain the noted concerns.

This code proposal is applicable to commercial residential buildings. Not to IRC residential structures. As it does not apply to IRC residential buildings a cost-benefit analysis is not applicable. This code amendment is the exact same code amendment that has been part of the fire code adoption for the past several cycles [..., 2006, 2009, 2012].

8.15.8.2

8.15.8.2 Closets and Pantries. ~~Sprinklers 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.

This code proposal is applicable to commercial residential buildings. Not to IRC residential structures. As it does not apply to IRC residential buildings a cost-benefit analysis is not applicable. This code amendment is the exact same code amendment that has been part of the fire code adoption for the past several cycles [..., 2009, 2012].

8.15.11.1

8.15.11.1 ~~Unless the requirements of 8.15.11.2 are met, S~~sprinkler protection shall be required in electrical equipment rooms.

Justification: This amendment is proposed as a companion to the amendment that deleted section 8.15.11.2. Since section 8.15.11.2 is deleted, then the portion of this section that refers to that section should also be deleted.

8.15.11.2

8.15.11.2 ~~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.

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.

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.

8.15.15.5

~~8.15.15.5 Sprinklers shall not be installed beneath drop-out ceilings or ceiling materials meeting the criteria in 8.15.15.1.~~

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 ft² (4.6 m²). 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.

8.15.27

8.15.27 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 8.15.27.

8.15.27.1 Hydraulic Design. Systems shall meet Density/Area Method requirements of Section 11.2.3.2 or the Pipe Schedule method of Section 23.7. The minimum design shall be for Ordinary Hazard Group 2, or higher design to accommodate the hazard within the temporary exhibit booth

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

8.15.27.3 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.

8.15.27.4 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.

8.15.27.5 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.

8.16.1.1.2.1

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.

8.16.4.1.4

8.16.4.1.4 ~~Listed heat tracing systems shall be permitted in accordance with 8.16.4.1.4.1 and 8.16.4.1.4.2.~~

Justification: This amendment reiterates Section 7.2.5.2.3. Section 7.2.5.2.3 provides requirements for dry pipe valves and their supply piping, but the code does not provide the same requirements for other system piping. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

8.16.4.1.4.1

8.16.4.1.4.1 ~~Where used to protect branch lines, the heat tracing system shall be specifically listed for use on branch lines.~~

Justification: This amendment reiterates Section 7.2.5.2.3. Section 7.2.5.2.3 provides requirements for dry pipe valves and their supply piping, but the code does not provide the same requirements for other system piping. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

8.16.4.1.4

8.16.4.1.4.2 ~~Electric supervision of the heat tracing system shall provide positive confirmation that the circuit is energized.~~

Justification: This amendment reiterates Section 7.2.5.2.3. Section 7.2.5.2.3 provides requirements for dry pipe valves and their supply piping, but the code does not provide the same requirements for other system piping. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

8.16.4.1.5.1

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

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 6.8.

Justification: This amendment intends to coordinate the requirements for local waterflow alarms that are described in Section 6.8.3.1 to the waterflow alarm that is discussed in Section 8.17.1.1. This is a companion to the proposals to Section 6.8, in order to ensure that code users know to look to Section 6.8 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.

8.17.2.4.1.3

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 in line 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 $C_p = 0.50$.

As written, the code proposal only conservative if the designer does not use the other design option. The proposed language allows the designer to use a value derived from seismic hazard maps. We are open to changing the stated value but feel the design option is already provided. We could also change the value to the maximum value listed

Justification: This amendment is existing in part. This amendment intends to require higher pressure ratings for underground lines and fittings 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. Note: AWWA/FM changed the pressure classification of C900 pipe. Per the Foreword of AWWA C900-07, Section IV.3: “The pressure classes were revised from 100, 150, and 200 psi ... to 165, 235, and 305 psi ... respectively.”

Underground piping connected to a fire pump or a fire department connection (FDC) shall have a minimum working pressure of 200 psi (Class 305).

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,~~ 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.

11.3.6

11.3.6 NONSTORAGE OCCUPANCIES WITH HIGH CEILINGS

11.3.6.1 Light and Ordinary Hazard Group 1 and 2 Occupancies with ceiling heights between 25 and 50 feet. Light and Ordinary Hazard 1 and 2 occupancies shall be designed to provide a minimum density of 0.10 gpm/ft², 0.15 gpm/ft² and 0.20 gpm/ft² 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.

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

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

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

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.

11.3.7

11.3.7 SPRINKLER PROTECTION FOR EXHIBITION SPACES AND STAGES WITH FLY GALLERIES

11.3.7.1 Exhibition Spaces and Stages with Fly Galleries with ceiling heights up to 35 feet. Sprinkler systems protecting exhibition spaces and stages with fly galleries with ceiling heights up to 35 feet shall be designed to provide a minimum density of 0.30 gpm/ft². 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.

11.3.7.2 Exhibition Spaces and Stages with Fly Galleries with ceiling heights between 35 and 60 feet. Sprinkler systems protecting exhibition spaces and stages with fly galleries with ceiling heights between 35 and 60 feet shall be designed to provide a minimum density of 0.45 gpm/ft². 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.

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

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/ft², 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.

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 SIZE ⁷	METER 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, as required by the AHJ:

1. **Fire Department Connections (FDC):** A 2½-inch fire department connection is required. A single snoot connection will be accepted. The FDC shall be located on the garage wall facing the street except for special circumstances where the FDC may be freestanding and located adjacent to the street or private drive. A freestanding FDC in these circumstances may be designed into the mailbox column.
2. **Riser Room:** Risers shall be located in either the garage or within a dedicated room with an exterior door. Provided the garage/room is fully insulated the requirement for maintaining 40°F will not require a source of heat.
3. **Inspectors Test Connection:** The inspectors test location may be piped off the system riser.
4. **Piping in locations less than 40°F:** Dry pipe systems are not permitted for the protection of living spaces, anti-freeze systems shall be used. The protection of non-living spaces such as attics may be protected by dry-pipe systems.
5. **Anti-Freeze Loops:** The capacity shall not exceed 80 gallons.
6. **Separate Water Supply:** A separate water lead-in for the fire sprinkler system along with an approved (by the local water authority) back-flow prevention device is required. The back-flow prevention device shall be located at the street with in an approved insulated enclosure. The lead-in shall be sized using the minimum pipe size available that provides the calculated flow.
7. **Control Valves:** All valves used to control the sprinkler system are required to be indicating. A Post Indicator Valve (PIV) is not permitted.
8. **Electrical Supervision:** When required by the *fire code official*, the main control valves shall be electrically supervised. The back-flow valves are not required to be electrically supervised.
9. **Fire Pumps:** Electric fire pumps normally accepted in NFPA – 13D systems for residential use (UL listed jockey pump) are acceptable.
10. **Notification Devices:** Interior – One (1) interior horn/strobe shall be installed in a location specified by the homeowner. Exterior – One (1) exterior horn/strobe shall be located above the FDC or other acceptable location. The sprinkler flow switch shall activate both of the required devices.
11. **Residential Sprinkler Heads:** Residential sprinkler heads shall be utilized and the design allowances specified in section 11.2.3.2.3.1 (reduction to design area) may be applied.
12. **Hangers and Earthquake Bracing:** The hanging of sprinkler pipe shall be in accordance Chapter 9. Earthquake bracing is not required.
13. **Garages:** Garages shall be protected as specified in NFPA 13R section 7.3 'Design Criteria – Garages'.
14. **Location of Sprinklers:** Sprinklers shall be installed in all areas except where omissions are permitted as follows:

- a. Inaccessible attic spaces.
- b. Exterior overhangs, porches, and carports.
- c. Rooms not provided with environmental control.
- d. Showers, saunas, steam rooms or other areas that would necessitate the installation of corrosion proof heads.
- e. Unconditioned spaces such as storage rooms or exterior accessible spaces that are subject to freezing.

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 essentially the same amendment that has existed in the local fire code adoptions for the past four cycles. 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.

23.4.1.7

23.4.1.7 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.

23.4.1.8

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

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

25.5.1

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 (1/4 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.

25.6.1.1 & 25.6.1.2

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 (1/4 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

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 ~~6.5.3~~ 6.6.8

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.

6.5

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 (No Change)

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

6.5.3 ~~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

7.5.6.1.1

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

JUSTIFICATION: Residential fire sprinklers are heat sensitive and operate within a narrow temperature range. They activate quickly in an incipient fire to control heat and smoke, providing a tenable environment for escape. If a residential sprinkler is exposed to excessive ambient heat, there is an elevated risk of a non-fire related activation. Therefore, extra care must be taken to protect all system components, particularly the sprinklers and water-filled piping network, from temperature extremes. The climatic conditions of southern Nevada summers are long and hot and the winters short and mild. Summer temperatures above 100° F occur rather frequently. This is an amendment required to address local climatic conditions

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 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 IRC⁴

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 SIZE⁷	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 the following:

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

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

Justification: This amendment is essentially the same amendment that has existed in the local fire code adoptions for the past four cycles. 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 than 10,000 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

12.1

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

Justification: Each homeowner should be given a copy of their approved fire sprinkler drawings for use in the event of any future remodel work. It has recently become an issue for some homeowners to be able to obtain their shop drawings from Records if the installing contractor has a copyright disclaimer on their drawings, which prevents Records from being able to release drawings without the written consent of the contractor. This could be a problem years from now when a subsequent homeowner tries to do a remodel, and the original sprinkler contractor is no longer in business.

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.

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 or 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.

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 305), 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. Note: AWWA changed the pressure classification of C900 pipe. Per the Foreword of AWWA C900-07, Section IV.3: "The pressure classes were revised from 100, 150, and 200 psi ... to 165, 235, and 305 psi ... respectively." Underground piping connected to a fire pump or a fire department connection (FDC) shall have a minimum working pressure of 200 psi (Class 305).

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

6.6.7

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

6.7.2.2.1

~~**6.7.2.2.1** Where listed heat tracing systems are used, they shall be supervised.~~

Justification: This amendment reiterates NFPA 13 Section 7.2.5.2.3. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

6.7.2.2.1.1

~~**6.7.2.2.1.1** Electric supervision of the heat tracing system shall provide positive confirmation that the circuit is energized.~~

Justification: This amendment reiterates NFPA 13 Section 7.2.5.2.3. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

6.7.2.2.2

~~**6.7.2.2.2** Where listed heat tracing is utilized for branch lines, it shall be specifically listed for use on branch lines.~~

Justification: This amendment reiterates NFPA 13 Section 7.2.5.2.3. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

6.7.2.2.3

~~**6.7.2.2.3** Heat tracing systems shall be supervised by one of the following methods:~~

- ~~(1) Central station, proprietary, or remote station signaling service~~
- ~~(2) Local signaling service that will cause a signal at a constantly attended location~~

Justification: This amendment reiterates NFPA 13 Section 7.2.5.2.3. This amendment would prohibit the use of heat tape for providing heat to any sprinkler system piping

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 service₂
- ~~(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

7.5

7.5 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 7.5 shall be applied.

Table 7.5 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC ⁴					
Building Area SIZE RANGE ⁶	Mitigation Residential SYSTEM TYPE ^{1,3}	SEPARATE SPRINKLER LEAD-IN REQUIRED ⁵	MINIMUM UNDERGROUND PIPE SIZE ⁵	MINIMUM WATER SIZE ⁵	METER 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.

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

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

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

Justification: This amendment is essentially the same amendment that has existed in the local fire code adoptions for the past four cycles. 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 Working plans shall be drawn to an indicated scale, on sheets of uniform size, with a plan of each floor, and shall show those items from the following list that pertain to the design of the system:

- (1) Project name/name of owner and occupant
- (2) Location, including street address
- (3) Point of compass
- (4) Ceiling construction
- (5) Full height cross-section or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping
- (6) Ceiling/roof heights and slopes not shown in the full height cross section

- (7) Location of partitions and fire walls, including lintels and doorways. Lintel openings require a cross section view to indicate the area of the opening
- (8) Location and size of concealed spaces, attics, closets, and bathrooms
- (9) Any small enclosures in which no sprinklers are to be installed
- (10) Size of city main in street and the city main test results including elevation of the test hydrant. Indicate whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main
- (11) Make, manufacturer, model, type, temperature rating, sprinkler identification number, ~~and~~ nominal K-factor and orifice size of the sprinkler, and the quantity of each sprinkler installed
- (12) Type and location of high-temperature sprinklers
- (13) Number of 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) Location and size of riser nipples
- (19) Type of fittings and joints and the location of all welds and bends
- (20) Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable
- (21) All control valves, check valves, drain pipes, and test connections
- (22) Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
- (23) Name, ~~and~~ address, phone number, and contractor's license number of sprinkler contractor
- (24) Nominal pipe size with lengths shown to scale
- (25) Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
- (26) A graphic representation of the scale used on all plans
- (27) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets
- (28) The minimum rate of water application and the design area of water application
- (29) The total quantity of water and the pressure required noted at a common reference point for each system. For hydraulically designed systems, the information on the hydraulic data nameplate
- (30) Relative elevations of sprinklers, junction points, and supply or reference points
- (31) Information about backflow preventers (manufacturer, size, type)
- (32) Information about antifreeze solution used (type and amount)
- (33) Size and location of hydrants, showing size and number of outlets; static and residual hydrants that were used in flow tests or models shall be shown
- (34) Size, location, and piping arrangement of fire department connections
- (35) Location of fuel-fired equipment and heating and air-conditioning equipment
- (36) Locations of closets on exterior balconies, and any doors or penetration between the closet and the dwelling unit
- (37) Edition year of NFPA 13R to which the sprinkler system is designed
- (38) Occupancy, label, and name for each area or room
- (39) Make, type, model, and size of alarm or dry pipe valve
- (40) Approximate capacity in gallons of each dry pipe system
- (41) Nevada State Fire Marshal registration number
- (42) Signature and NICET number, or engineer's seal, of the designer
- (43) General notes as required by the AHJ

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 criteria. 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 13R systems are similar to submittals for 13 systems

NFPA 14

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 Unless the requirements of 4.8.2.1 or 4.8.2.2 are met, the fire department connection shall have at least two 2 ½ inch (65 mm) internal threaded fittings having NHS threads, as specified in NFPA 1963. 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.

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 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.

6.4.5.3.1

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

7.2.3.2

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)~~, a listed pressure regulating device shall be provided to limit static and residual pressures at the outlet of the hose connection to no more than 200 psi (13.9 bar) ~~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-regulating device shall be provided in accordance with *NFPA 72*.
- (10) A drain sufficient to allow flow of the full anticipated system flow shall be provided adjacent to the pressure-regulating devices. Use of this drain line for discharge from the pressure relief valve shall be permitted.

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 (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

7.3.2.10

7.3.2.10 Additional hose connections shall be provided in unsprinklered buildings ~~where the distance from connections required by 7.3.2.1 through 7.3.2.3 to the most remote portion or story exceeds 150 ft (45.7 m); 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

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.

7.3.2.11

7.3.2.11 Additional hose connections shall be provided in buildings sprinklered in accordance with NFPA 13 or NFPA 13R ~~where the distance from connections required by 7.3.2.1 through 7.3.2.3 to the most remote portion or story exceeds 200 ft (61 m); 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

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.

7.3.3.1

7.3.3.1 Class II systems shall be provided with 1½ in. (40 mm) hose stations so that all portions of each floor level of the building or area thereof required to be protected are within 130 ft (39.7 m) of a hose connection provided with 1½ in. (40 mm) hose ~~or within 120 ft of a hose connection provided with less than 1½ 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 1½ inch, with no lower limit. Hose with diameter less than 1½ 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

7.11.1.1.1

7.11.1.1.1 The drain riser connections 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.

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, address, phone number, and contractor's license number 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 water supply, with pressure and elevation including water storage tanks and fire department connections
- (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 lengths of pipe (or center-to-center dimensions)
- (11) Manufacturer and 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, and seismic calculations
- (13) All control valves, check valves, drain pipes, and test connections
- (14) Make, type, model and size of alarm, dry pipe, or deluge valve
- (15) Type and location of alarms
- (16) Size and location of standpipes, hose outlets, hand hose, nozzles, cabinets, and related equipment with details from the manufacturer including model numbers and sizes
- (17) Information on the hydraulic data plate
- (18) Hydraulic reference points shown on plan including the top view, section view, and isometric view, that correspond with comparable reference points on the hydraulic calculation sheets
- (19) The setting for pressure-reducing and pressure-restricting valves including direct-acting and pilot-operated valves, and provide a detail for each unique installation configuration
- (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 with details of the connection
- (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)
- (28) Provide a detailed narrative describing the scope of work to be conducted including the system type and class, minimum and maximum pressure requirements, the type of freeze protection if applicable, the total quantity of hose valves being installed, and the pressure required for the hydrostatic test, being 200 psi or 50 psi above pump churn pressure, whichever is higher
- (29) Nevada State Fire Marshal registration number
- (30) Signature and NICET number, or engineer's seal, of the designer
- (31) General notes as required by the AHJ
- (32) Provide an isometric view showing the entire system in one view including hydraulic reference points
- (33) Full height cross section with ceiling construction
- (34) Location of fire walls, partitions, and horizontal exits
- (35) Label and name of each area or room
- (36) 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
- (37) Provide information regarding the fire pump, as applicable
- (38) Provide a detail of each required sign
- (39) Plan view shall 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
- (40) Provide a 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 minimum clearances of 6 inches perpendicularly from the face of the valve, 1 inch around the circumference of the valve, and 6 inches around the circumference of the hose outlet cap.
- (41) Where the equipment is to be installed is an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
- (42) 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
- (43) Provide details for all penetrations in rated walls and floors, providing information regarding the method of maintaining fire rating of the wall or floor
- (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.

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

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.

11.5.5.1.2

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

Justification: This code is written to help the issue of Owner/Contractors changing the Pressure Setting of existing Pressure Reducing Stations. If the setting is posted then the inspector and designer will know what the pressure is supposed to set at. If the setting is posted then the problem can be identified much easier especially if the valve is existing.

There is an issue in the valley at several larger properties where they have multiple pumps feeding several Pressure Reducing Stations. The Pressure Reducing Station are being field adjusted to a lower pressure to solve leaks, which leaves the sprinkler/standpipe system downstream with not enough pressure to operation correctly.

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

4.11.1.1

4.11.1.1 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

4.11.2.1

4.11.2.1 Unless the requirements of 4.11.2.4 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

4.15.4.1

4.15.4.1 ~~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.4.15.4.)

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.

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 and have clear access to 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 and have clear access to 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*, 2011, or AWWA D103, *Factory-Coated Bolted Steel Tanks for Water Storage*, 2014.

Justification: This amendment is established to address committee concerns. The documents referenced here are from 2.3.9 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 to a water supply shall be provided to fill the tank, except as provided in 14.4.1.1. Where the tank serves as a break tank between the city supply and fire pump(s), the fill shall be through automatic fill valves that are tied to water level sensors, and a bypass line of equal size with a normally closed control valve shall be provided.

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 in accordance with 4.2.1.4. Where the tank serves as a break tank between the city supply and building fire pump(s), the means to fill the tank shall be automatic and shall provide supply flow equal to 150% of the fire pump rated flow.

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.

14.6.1.1

14.6.1.1 Discharge. The overflow pipe shall discharge water to a drain with flow capacity equal to or greater than the fill line supply flow, or to an approved exterior location subject to approval by the authority having jurisdiction.

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.

14.9.1

14.9.1 Provisions shall be made for the installation of sensors in accordance with *NFPA 72* for two critical water temperatures and two critical water levels and two critical pressure readings (for pressure tanks only).

14.9.1.1 Where the water storage tank acts as a break tank between the city supply and fire pump(s), water level sensors shall be provided. A minimum of three sensor levels shall be provided. Two sensor levels shall activate the turn-on/turn-off of the fill valve. The third sensor level shall indicate a low level alarm. The sensor that opens the fill control valve shall be set 5 inches (127 mm) below normal (full) level, or at 90% of the normal (full) volume, whichever leaves the greater volume in the tank. The sensor that closes the fill control valve shall be set at normal (full) level. The sensor that signals a low alarm shall be set 12 inches (300 mm) below normal (full) level, or at 70% of the normal (full) volume, whichever leaves the greater volume in the tank. The low level alarm shall be transmitted to a constantly attended location to initiate response to the fill control bypass valve

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 on a river, pond, or lake where a main crosses water
- (2) Outside the building foundation(s) where a main or a section of a main is installed under a building
- (3) On the underground line where there are two sources of water, after every 2 fire hydrants or building fire sprinkler connections

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

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 sprinkler monitoring systems shall not be required to have smoke detectors installed above the dedicated function control unit.

Justification: This section is limited to an approved fire alarm system including full notification throughout. Dedicated function fire sprinkler monitoring 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 systems.

12.2.4

12.2.3* The installation of all pathway wiring, cable and equipment shall be in accordance with *NFPA 70, National Electric Code* and the applicable requirements of 12.2.3.1 through 12.2.3.3. 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.

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

Conductor Properties NEC Chapter 9 Table 8 (Uncoated Copper), see AHJ for other values

<u>Wire</u>	<u>R (1-Strand / 7 Strand)</u>	<u>CM</u>
<u>No 18</u>	<u>7.77 / 7.95</u>	<u>1,620</u>
<u>No 16</u>	<u>4.89 / 4.99</u>	<u>2,580</u>
<u>No 14</u>	<u>3.07 / 3.14</u>	<u>4,110</u>
<u>No 12</u>	<u>1.93 / 1.98</u>	<u>6,530</u>

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 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 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 is 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.

18.4.2.4

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 or prepared by a NICET Level IV fire alarm designer and shall include the following:

- (1) Inverse Square Law calculations using each of the vertical and horizontal polar distribution angles in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, or equivalent.
- (2) The calculations shall account for the effects of polar distribution using one of the following:
 - a. The percentages from the applicable table(s) in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, or equivalent.
 - b. The actual results of laboratory tests of the specific appliance to be used as recorded by the listing organization.

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.

21.7.2

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, or fire doors shall be monitored for integrity in accordance with Sections 12.6 and 23.8.5.4.6.

Justification: The proposed amendment is to add further clarity for non-system type detection devices utilizing separate power circuits to insure the trouble contacts are connected in such a manner to cause a trouble signal at the fire alarm control unit upon loss of power. Some of the HVAC units are being shipped with integral duct detectors. Power operated devices connected to a building fire alarm control unit should be provided by the supplying contractor due to current and battery calculations. Detectors being shipped by the manufacturer does not allow the fire alarm vendor to properly maintain the calculations. The addition of a remote reset switch for this type of detector would be beneficial to the building owner as without the reset switch access to the unit would be required. This switch would only reset the power to the detector and would still require a reset at the fire alarm control unit.

This amendment addresses the requirement for initiating device wiring to be properly monitored for integrity as is required by Sections 12.6 and 23.8.5.4.6 of NFPA 72.

21.7.9

21.7.9 Where duct detectors are installed in accordance with the UMC Section 608.1, automatic shut-off shall be accomplished by interrupting the power source or utilizing the stop input, if provided on the air moving equipment.

Justification: The proposed amendment is added to bring the mechanical code verbiage into the fire code. By interrupting the power source or utilizing the stop input of the unit, there is no coast down time which on some units have demonstrated to take up to 2 minutes. Units have been found in the field to be connected to thermostat or control wiring.

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 water flow 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.

23.8.6.3.2

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.

23.8.6.5.1 Power Loss Calculations. A calculation for each circuit shall be provided to the authority having jurisdiction demonstrating simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB). Power loss calculations similar to the following shall be used:

$$P_{\text{Loss}} = 10 * \log [1 - ((2 * RL) / (2 * RL + (V_{\text{Line}}^2 / P_{\text{Rated}})))]$$

$$RL = (R_{\text{Ref}} / 1000) * D$$

With variables defined as follows:

D = length of wire used (in feet)

P_{Loss} = power loss (in dB)

P_{Rated} = power driven on line from the amplifier (in watts)

RL = wire gauge resistance (in ohms)

R_{Ref} = wire resistance based on gauge of wire used (in ohms/ft.)

V_{Line} = voltage on line (typically 25 volts or 70 volts)

Alternatively the distance may be calculated using a calculation similar to:

$$D = (61 / R_{\text{Ref}}) * (V_{\text{Line}}^2 / P_{\text{Rated}})$$

23.8.6.5.2 Power Loss Tables. To ensure circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB), wiring shall be limited to the distance allowed in Tables 23.8.6.5.2.a and 23.8.6.5.2.b.

Table 23.8.6.5.2.a, 25 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	12	19	31	49	79
150	16	26	41	66	105
100	25	39	62	99	158
75	33	52	83	132	210
60	41	65	104	165	263
50	49	78	124	198	315
40	61	97	155	247	394
30	82	130	207	329	525
25	98	156	248	395	630

**Table 23.8.6.5.2.b, 70 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss**

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	98	156	248	395	630
150	131	208	331	527	840
100	196	312	497	790	1260
75	262	416	662	1053	1680
60	327	520	828	1317	2100
50	392	624	993	1580	2520
40	491	780	1242	1975	3150
30	654	1039	1656	2633	4200
25	785	1247	1987	3160	5041

*Cable Ohms is expressed in ohms per 1000 feet (2008 NEC Ch.9 Table 8, uncoated, single strand copper, see NEC or AHJ for other values)

The length represented accounts for both wires in the circuit.

23.8.6.5.3 Manufacturers Power Loss Calculator. When allowed by the authority having jurisdiction manufacturers calculations showing circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) are acceptable.

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

24.4.9.4 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.