CLARK COUNTY FIRE CODE AMENDMENTS

Adoption

13.04.020 Adoption. That certain document, three copies of which are on file in the Office of the County Clerk in the Clark County Government Center, being marked and designated as the "International Fire Code, 2012 edition" published by the International Code Council, together with all tables of contents, definitions, articles, tables, indices, examples and the following appendices: Appendix B Fire-Flow Requirements for Buildings; Appendix C Fire Hydrant Locations and Distribution; Appendix H Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) Instructions; Appendix K Proprietary (Self) Monitoring, Appendix L Fire Protection Systems – Impairments and Systems out of Service; is hereby designated as the Fire Code of Clark County and by this designation and reference is adopted and made a part of this chapter, the same as if it were fully set forth herein.

That certain document, three copies of which are on file in the office of the County Clerk of Clark County, being marked and designated as the "Southern Nevada Amendments to the 2012 International Fire Code," together with all tables of contents, definitions, articles, tables, indexes, examples and appendices, is hereby adopted and made a part of this chapter, the same as if it were fully set forth herein, except as amended by this chapter.

13.04.060 Amendments to International Fire Code. Certain parts, articles, divisions, sections and subsections of the 2012 International Fire Code are supplemented, modified, amended and deleted as provided in the following sections of this chapter. Notwithstanding anything to the contrary contained in the International Fire Code, the terms "chief" or "fire code official" as used in that Code shall be the Building Official of Clark County.

IFC CHAPTER 1

"101.1 Title" is amended to read as follows:

101.1 Title. These regulations shall be known as the *Fire Code* of Clark County, hereinafter referred to as "this code".

"101.2.1 Appendices" is amended to read as follows:

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

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

"101.6 Supplemental Rules and Regulations" is added to read as follows:

101.6 Supplemental Rules and Regulations. The chief is authorized to render interpretations of this code and to make and enforce rules and supplemental policies, regulations and guidelines in order to carry out the application and intent of its provisions. Such interpretations, rules, policies, and guidelines shall be in conformance with the intent and purpose of this code and shall be available to the public during normal business hours.

"102.7.3 Local codes" is added to read as follows:

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

IBC-12 2012 International Building Code

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

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

IRC-12 2012 International Residential Code

"104.9 Alternative materials and methods" is amended to read as follows:

104.9 Alternative materials and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any method of construction not specifically prescribed by this code, provided that any such alternative has been approved. The fire code official is authorized to approved an alternative material or method of construction where the fire code official finds that the proposed design is satisfactory and complies with the intent of the provision of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. The fire code official is authorized to require design submittals to be prepared by, and bear the stamp of, a Nevada registered design professional.

"104.12 Citations" is added to read as follows:

104.12 Citations. The Fire Code Official is authorized to issue a citation to persons operating or maintaining an occupancy, premises or vehicle subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises or vehicle when ordered or notified to do so.

"105.1.1 Permits required" is amended to read as follows:

105.1.1 Permits required. Any property owner or authorized agent who intends to conduct an operation or business, or install or modify systems and equipment which is regulated by this code, or to cause any such work to be done, shall first make application to the fire code official and obtain the required permit. Permit fees shall be assessed in accordance with Section 113.

"105.1.3 Multiple permits for the same location" is amended to read as follows:

105.1.3 Multiple permits for the same location. When more than one permit is required for the same location, the fire code official is authorized to consolidate such permits into a single permit provided that each provision is listed in the permit. Where multiple individual permits are combined, the associated permit fees per Section 113 shall be accumulated to derive the required permit fee.

"105.1.4 Certification of Insurance" is added to read as follows:

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

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

105.1.4.1 Certificate Information Required. The certificate shall be issued by an insurance company authorized to conduct business in the State of Nevada, or be named on the list of

authorized insurers maintained by the Nevada Department of Business and Industry, Division of Insurance.

The following information shall be provided on the certificate:

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

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

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

"105.2 Application" is amended to read as follows:

105.2 Application. Application for a permit required by this code shall be made to the fire code official in such form and detail as prescribed by the fire code official. Applications for permits shall be accompanied by such plans as prescribed by the fire code official

Applications shall be filled out by the owner, contractor, or representative thereof. The application type, permit service requested, the property description, and applicant information shall be provided on approved forms. The minimum fee indicated on the appropriate application form shall be remitted at time of application. For the full permit fee schedule, see Section 113.

Submittals shall include a minimum of two copies of plans and supporting documentation. Such plans and documentation shall show compliance with this code, as amended and adopted in this jurisdiction. All plans and submittal shall be clear, legible and readable.

"105.3.1 Expiration" is amended to read as follows:

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

have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year. Permits are not transferable and any changes in occupancy, operation, tenancy or ownership shall require a new permit to be issued.

"105.6.2 Amusement buildings" is amended to read as follows:

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

"Table 105.6.8 PERMIT AMOUNTS FOR COMPRESSED GASES" is amended to read as follows:

TABLE 105.6.8
PERMIT AMOUNTS FOR COMPRESSED GASES

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

"105.6.13 Exhibits and trade shows" is amended to read as follows:

105.6.13 Exhibit and trade shows. An operational permit is required to operate exhibits and trade shows with an occupant load of 300 persons or greater.

"105.6.23 Hot work operations" is amended to read as follows:

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

1. Public exhibitions and demonstrations where hot work is conducted.
2. Use of portable hot work equipment inside, upon, or within 10 feet of a structure.
   Exception: Work that is conducted under a construction permit.
3. Fixed-site hot work equipment such as welding booths.
4. Hot work conducted within a hazardous fire area.
5. Application of roof coverings with the use of an open-flame device.
6. When approved, the *fire code official* shall issue a permit to carry out a Hot Work Program. This program allows approved personnel to regulate their facility's hot work operations. The approved personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in Chapter 35. These permits shall be issued only to their employees or hot work operations under their supervision.

"105.6.27 LP-gas" is amended to read as follows:

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

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

"105.6.32 Open flames and candles" is amended to read as follows:

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

"105.6.34 Places of assembly" is amended to read as follows:

105.6.34 Places of assembly. An operational permit is required to operate a place of assembly with an occupant load of 300 persons or greater.

"105.6.40 Heliports, Helistops, and Emergency Landing Pads" is amended to read as follows:

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

"105.6.47 Emergency responder radio coverage system" is added to read as follows:

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

"105.6.48 Filming" is added to read as follows:

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

"105.6.49 Firewood" is added to read as follows:

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

"105.6.50 Flame Effects" is added to read as follows:

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

"105.6.51 Mobile fueling vehicle" is added to read as follows:

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

"105.6.52 Monitoring facilities" is added to read as follows:

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" is added to read as follows:

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

"105.6.54 Radioactive Materials" is added to read as follows:

105.6.54 Radioactive Materials. An operational permit is required to store or handle at any installation any amount of radioactive material for which a specific license from the Nuclear Regulatory Commission and/or Nevada State Health Division Radiation Control is required.

"105.6.55 Special Activity" is added to read as follows:

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" is added to read as follows:

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

"105.6.57 Wood and plastic pallets" is added to read as follows:

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

"105.6.58 Asbestos Removal" is added to read as follows:

105.6.58 Asbestos Removal. To conduct asbestos-removal operations regulated by Chapter 33.

"105.6.59 Battery Systems" is added to read as follows:

105.6.59 Battery Systems. An operational permit is required to operate a stationary storage battery systems having a liquid capacity of more than 50 gallons (189L).

"105.7 Required construction permits" is amended to read as follows:

105.7 Required construction permits. The fire code official is authorized to issue construction permits for work as set forth in Section 105.7.1 through 105.7.16.

Where both an operational permit per Section 105.6 and a construction permit per 105.7 of the same title are required, a single submittal covering both the operational and construction permit requirements shall be acceptable.

"105.7.1 Fire suppression and extinguishing systems" is amended to read as follows:

105.7.1 Fire suppression and extinguishing systems.

A construction permit is required for the following:

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

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

"105.7.3 Compressed gases" is amended to read as follows:

105.7.3 Compressed gases. When the compressed gases in use or storage exceed the amounts listed in Table 105.6.8, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service or close or substantially modify *a compressed gas system.*

Exceptions:

1. Routine maintenance.
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

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

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

"105.7.4 Cryogenic fluids" is amended to read as follows:

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

"105.7.6 Fire alarm and detection systems, related equipment and dedicated function fire alarm systems (i.e., monitoring)" is amended to read as follows:

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

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

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

"105.7.12 Fire hydrants and associated supply piping" is amended to read as follows:

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

"105.7.17 Access gates" is added to read as follows:

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

"105.7.18 Fire apparatus access road plan" is added to read as follows:

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

"105.7.19 Fire protection report" is added to read as follows:

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

"105.7.20 Heliports, Helistops, and Emergency Landing Pads" is added to read as follows:

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

"105.7.21 Heliports, Helistops, and Emergency Landing Pads" is added to read as follows:

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

"105.7.22 Radioactive Materials" is added to read as follows:

105.7.22 Radioactive Materials. A construction permit is required to store or handle at any installation any amount of radioactive material for which a specific license from the Nuclear Regulatory Commission and/or Nevada State Health Division Radiation Control is required.

"105.7.23 Smoke Control System Control Panel" is added to read as follows:

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

"105.7.24 Smoke Removal System Control Panel" is added to read as follows:

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

"105.7.25 Two-way communication systems" is added to read as follows:

105.7.25 Two-way communication systems. A construction permit is required for the installation of a two-way communication system. See Section 1007 and NFPA 72.

"105.7.26 Water tanks" is added to read as follows:

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

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

"SECTION 108 BOARD OF APPEALS" is amended to read as follows:

SECTION 108
BOARD OF FIRE CODE APPEALS

108.1 Board of fire code 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 fire code appeals.

The board of fire code appeals shall be appointed by the governing body and shall hold office at its pleasure. The *fire code official* shall be the secretary of said board but shall have no vote on any matter before the board. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *fire code official*.

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

108.3 Qualifications. The board of fire code 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 Fire Prevention Bureau.

108.4 Members. The members shall be qualified by training and experience to decide matters pertaining to building construction and building service equipment. The members shall not be employees of the Fire Prevention Bureau. The members of the Board shall consist of the following:

1. One (1) Fire Protection Engineer registered by the State of Nevada;
2. One (1) Civil Engineer registered by the State of Nevada;
3. One (1) fire sprinkler contractor licensed by the State of Nevada;
4. One (1) fire alarm contractor licensed by the State of Nevada;
5. One (1) representative of the exhibit and trade industry;
6. One (1) specialist, as identified in Section 104.7.2, in fire safety;
7. One (1) specialist, as identified in Section 104.7.2, in hazardous materials;
8. One (1) layperson; and
9. The Fire Chief of Clark County Fire Department.

The members of the Board of Fire Code Appeals shall be appointed for terms of four years by the Board of County Commissioners and may be removed from office at any time by the Board of County Commissioners.

108.5 Procedures. The Board of Fire Code Appeals shall adopt rules and procedures for conducting its investigations and hearings. A person (the appellant) who wishes to appeal a determination of the Fire Code Official to the Board shall submit a written request for appeal to the Fire Code Official. The Fire Code Official shall provide to the appellant a copy of the guidelines for preparing appeals and a copy of the Board's rules and procedures. The appellant will be responsible to prepare a written appeal in compliance with the guidelines. The Fire Code Official will schedule a hearing before the Board. The Fire Prevention Division may submit information and evidence in support of the Fire Code Official's determination. The Board shall issue a written decision based on the evidence presented at the hearing. The decision shall be signed by the Chairman of the Board, and shall be filed with the Fire Code Official. A copy of the decision will be delivered to the appellant by U. S. certified mail.

108.6 Limitation and Scope of Authority. The Board of Fire Code Appeals shall have no authority relative to interpretation of the administrative provisions of this Chapter or the administrative provisions of the technical codes nor shall the Board be empowered to waive requirements of either this Chapter or the technical codes.

108.7 Liability. Neither the Board of Fire Code Appeals nor any member thereof shall be liable for, and the Board and each member thereof is hereby relieved from all personal liability for any damage that may accrue to persons or property as a result of any good faith act or by reason of any good faith act or omission in the discharge of any duty specified herein. Any suit brought against the Board or any member thereof resulting from such act or omission

performed by them as members of the Board in the performance of their duties shall be considered an act of Clark County and shall be subject to its liability insurance coverage.

108.8 Tests and Research. Appellants shall cause to be made at their own expense any tests or research necessary to support their claims before the Board of Fire Code Appeals.

"109.4 Violation penalties" is amended to read as follows:

109.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the approved construction documents or directive of the fire code official, or of a permit or certificate used under the provisions of this code, shall be liable to fines and/or imprisonment as determined by the authority having jurisdiction.

"111.4 Failure to comply" is amended to read as follows:

111.4 Failure to comply. Any person who shall continue any work after being served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine as determined by the *fire code official*.

"113.6 Permit and Service Fee Schedule" is added to read as follows:

113.6 Permit and Service Fee Schedule. Fees for permits, inspections and other services shall be as set forth in the Permit and Service Fee Schedule, as adopted and amended from time to time by the Commission of Clark County. Permits, plan reviews and other services shall be charged the fees identified in Table 113-A through Table 113-G.2.2.

Table 113-A

Base Fee of $80 (No Escalation)	
Permit Name	
Asbestos removal	LP gases (Commercial aggregrate, 30-4,000 gallons)
Aviation Facilities, Aircraft refueling vehicles	Lumber yards and woodworking plants
Battery systems	Magnesium/Magnesium Working
Bond Release	Miscellaneous Combustible Storage
Carnivals/Fairs	Mobile Fueling Vehicle
Cellulose nitrate film	Monitoring Facilities
Combustible Fibers	Mylar Signature
Dry Cleaning Plant (Class IV and V)	Open burning
Emergency responder radio coverage system	Proprietary(self) monitoring

Explosives - Use	Pyroxylin (cellulose nitrate) Plastics Storage
Filming	Radioactive materials
Fire apparatus access road plan	Repair garages and motor vehicle fuel-dispensing station (dispensers)
Fire Hydrants and Associated Supply Piping - Installation	Repair garages and motor vehicle fuel-dispensing station (repair garage)
Fire Pumps	Smoke control system panel(s)
Firewood	Smoke removal system panel(s)
Flame Effects (includes fire performers)	Storage of scrap tires and tire byproducts
Floor Finishing	Tire-rebuilding plants
Fruit and crop ripening	Tire Storage
Fumigation and thermal insecticidal fogging (business location only)	Two-way communication systems
Heliports, Helistops, and Emergency Landing Pads	Waste handling
Liquid- or gas-fueled vehicles /equipment in assembly buildings (per event, not per vehicle)	Water Tanks
LP gases (Single family residence)	Wood pallets
	Wood products

Table 113-B

$80 per count of components	
Permit Name	**Explanation of Escalation**
Access Gates	Escalation per gate (automatic or manual)
Amusement Buildings	Escalation per amusement building
Covered mall buildings - Kiosks	Escalation per kiosk

Explosives - Storage	Escalation per fireworks stand bunker or magazine
Fire Hydrants and Associated Supply Piping - Plan Review	Escalation per hydrant
Hot-work operations	Escalation per location, mobile, fixed, combination
Industrial Ovens	Escalation per oven
Open Flames and Candles	Escalation per type of device, not per device count, i.e. candles, gelled alcohol flames (sterno), portable stoves, etc.
Pyrotechnic special effects materials – July 4 Sales Booth	Escalation per each booth
Special Activity Lot	Escalation per activity, i.e. Christmas Tree Lot, Pumpkin Patch, Hay-Ride Lot, etc.
Spraying or dipping	Escalation per booth/spray area/dipping area

Table 113-C (a)

Fee of $80 per Range Unit, as Determined by Volume of Material per Table 113-C(b)	
Permit Name	
Aerosol Products - excess of 500 lbs.	Flammable and combustible liquids -Aboveground Storage/Use
Compressed gas/Medical gas	Hazardous Materials and/or HPM Facilities
Cryogenic Fluids	LP gases (Commercial aggregrate, over 4,000 gallons)
Dry cleaning plants (Classes I, II, IIIA, IIIB)	Organic coatings
Flammable and combustible liquids - Underground Storage/Use	Refrigeration equipment

Table 113-C (b)

PERMIT CALCULATION TABLES - FEE IS $80 TIMES THE RANGE	
Liquids in Gallons	**Range**
X 3.785 for L	
0	0
>0 - <54	1
54 – <500	2
500 - <946	3
946 - <1,836	4
1,836 - <4500	5
4,500 - <15,180	6
15,180 - <65,681	7
65,681 - <70,000	8
70,000 - <75,000	9
75,000 - <80,000	10
80,000 - <85,000	11

85,000 or greater	12
Solids by Pounds **X 0.4536 for kg**	**Range**
0	0
>0 - <499	1
499 - <1,000	2
1,000 - <2,000	3
2,000 - <3,000	4
3,000 - <4,000	5
4,000 - <5,000	6
5,000 - <10,000	7
10,000 - <11,000	8
11,000 - <12,000	9
12,000 - <13,000	10
13,000 - <14,000	11
14,000 or greater	12
Gases by Cubic Feet **X 0.028 for m^3**	**Range**
0	0
>0 - <199	1
199 - <1,999	2
1,999 - <3,600	3
3,600 - <6,800	4
6,800- <16,400	5
16,400 - <35,000	6
35,000 - <54,000	7
54,000 - <74,000	8

74,000 - <80,000	9
80,000 - <85,000	10
85,000 - <90,000	11
90,000 or greater	12

Table 113-D

SQUARE FOOTAGE TABLES	
FEE IS $80 TIMES THE RANGE	
SF	Range
Permit Threshold – 14,999 sf	1
15,000 sf – 74,999 sf	2
75,000 sf and greater	3
Permit Name	
Aviation Facilities, Aircraft repair hangar	High pile storage
Combustible dust-producing operations	Places of Assembly
Exhibits and trade shows*	Temporary outdoor membrane structures and tents

* A single temporary event permit is allowed for separate rooms that are used for the same event/use, provided the rooms are located on the same floor level and are within 250 feet of each other, as measured along egress routes

Table 113-E

FIREWORKS/PYROTECHNICS	
FEE IS $80 TIMES THE RANGE	
DEVICE COUNT	Range
0 – 500 device	1
501 – 1,500 devices	2

1,500 – 2,500 devices	3
2,501 or more devices	4
Permit Name	
Explosives - Fireworks/Pyrotechnics	Pyrotechnic special effects materials - Fireworks/Pyrotechnics

Table 113-F

PERMIT FEE VALUATION TABLE	
FEE IS CALCULATED PER TABLE CALCULATION	
Total Valuation	Fee Calculation
$1 to $500	$80.00
$501 to $2,000	$80.00 for the first $500.00 plus 0.04% for additional valuation, to and including $2,000.00
$2,001 to $25,000	$80.60 for the first $2,000.00 plus 0.05% for additional valuation, to and including $25,000.00
$25,001 to $50,000	$92.10 for the first $25,000.00 plus 0.375% for additional valuation, to and including $50,000.00
$50,001 to $100,000	$185.85 for the first $50,000.00 plus 0.425% for additional valuation, to and including $100,000.00
$100,001 and up	$398.35 for the first $100,000.00 plus 0.36% for additional valuation.

Contract valuations supplied by the applicant shall be utilized by the Fire Code Official. The Fire Code Official reserves the option of requesting appropriate additional documentation of contract valuations supplied by the applicant. Final building permit valuations shall be set by the Fire Code Official.	
Permit Name	
Fire alarm and detection systems, related equipment and dedicated function fire alarm systems (i.e., monitoring)	Fire suppression and extinguishing systems (other)
Fire suppression and extinguishing systems (fire sprinklers)	Standpipes

Table 113-G

FEES FOR OTHER SERVICES		
SERVICE	**Fee**	**Comments**
Reinspection fees	$80 per hour	Minimum one hour, to include travel time. Applies to 2nd reinspection for same deficiencies.
Overtime Inspection fees (Outside of regular work hours)	$80 per hour	Minimum three hours, to include travel time. Inspections requested outside of regular business hours.
Overtime Inspection fees (Extension of work day)	$80 per hour	Actual time worked. Minimum one hour, to include travel time.
Same-Day Inspection Fee	$240	Also responsible for inspector's overtime.
Requests for Search of Fire Prevention Records	$80 per hour	Minimum $80 per address searched. Includes tasks such as environmental site assessments, outstanding violations, etc.

FEES FOR OTHER SERVICES		
SERVICE	**Fee**	**Comments**
Inspections or service for which no fee is specifically indicated	$80 per hour	Actual time worked. Minimum one hour, to include travel time. Fee is assessed for inspections and services for any building, structure or premise which is not covered by an existing valid building permit or for other situations where requested by the customer, for work to be conducted at the option of the Building Official.
Final Map	$0	No charge for signature of final map
Additional plan review fees	$80 per hour	Minimum one hour. Rounded to next quarter-hour. Applies to revisions and 2nd/subsequent resubmittal to address recurring correction comments.
Sprinkler Design Flow Test	$80	To establish basis for fire sprinkler system design
Next Day Plan Review	$160	Based on $80 permit fee and $80 expedite fee, applies to certain application types only
Express Plan Review	$160	Based on $80 permit fee and $80 expedite fee, applies to certain application types only
Over-the-counter Review	$160	Based on $80 permit fee and $80 expedite fee, applies to certain application types only
Letters of Agreement and other reviews	$80 per hour	Combustible load-in policy, phased system installation, TCO approval letters, evacuation plans, smoke control/removal recertification reports etc.
Customer-requested reviews	$80 per hour	Reviews requested by customers not otherwise required by codes

FEES FOR OTHER SERVICES		
SERVICE	**Fee**	**Comments**
Fire Protection Report – tenant improvement/remodel	$80 per hour	Per report
Fire Protection Report – Full facility, alternate methods, TCO	$160, or $80 per hour, whichever is greater	Per report
Copies (8-1/2 x 11)	$1.00 per page for the first 10 pages, $0.50 each page thereafter of the same document	
Copies (11 x 14)	$2.00 per page	
Copies (D or E size plans)	$4.00 per page	
Certification	$2.00 per page	
Research and document assembly	$40.00 per hour, ½ hour minimum billed to the next ½ hour	
CD's	$50.00 per CD, plus $1.00 per each document. Fee includes preparation time and up to ½ hour research	
Returned Check Fee	$25	
Address change	$0	
Renewable permit late fee	$80 per each 30-day period past the renewable due date	

FEES FOR OTHER SERVICES		
SERVICE	**Fee**	**Comments**
Extension of unexpired construction permit	$40 for each extension of time for an unexpired construction permit	
Apparatus Standby	$300 per hour	Minimum of 4 hours per apparatus
Nuisance Alarm Fee	$500	
Any additional services not specified herein	$80 per hour	

Table 113-G.1

Service delivery (except Tier 1 and Tier 2 temporary operational permits from Table 113-D)

20 business-day plan review fee	1x base total permit fee	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 20 business days.
10 business-day plan review fee	2x base total permit fee, or base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 20 business days. This fee provides for 10 business-day turnaround of plan review. Applies when event occurs 10 or more business days up to 19 business days after the day of permit application, or when the applicant requests plan review completion 10 or more business days up to 19 business days after the day of permit application.

3 business-day plan review fee	3x base total permit fee, or 2x base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 20 business days. This fee provides for 3 business-day turnaround of plan review. Applies when event occurs 3 or more business days up to 9 business days after the day of permit application, or when the applicant requests plan review completion greater than 3 or more business days up to 9 business days after the day of permit application.
Immediate plan review fee	4x base total permit fee, or 3x base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 20 business days. This fee provides for immediate turnaround of plan review. Applies when event occurs the day of submittal up to 2 business days after the day of permit application after the day of permit application, or when the applicant requests plan review completion the day of submittal up to 2 business days after the day of permit application. Please note this service is subject to staff availability.
First Resubmittal of initial plans sent back with correction comments	$0 for first resubmittal of initial submittal, at the same service level as the initial submittal	For more aggressive service delivery for the first resubmittal, see Table 113-G.1.1 below. Please note that where table calls for either a multiple of the permit fee or the hourly rate, that the lower of the two fees applies
All revisions of approved plans and all second/subsequent resubmittals	1x base total permit fee or the hourly rate times plan review time (whichever is less), at the same service level as the initial submittal	For more aggressive service delivery for all revisions and all second/subsequent resubmittals, see see Table 113-G.1.2 below. Please note that where table calls for either a multiple of the permit fee or the hourly rate, that the lower of the two fees applies

Table 113-G.1.1 First Resubmittals

Initial Service	Free Resubmittal	Added 1x of either base permit Fee or Hourly Rate	Added 2x of either base permit Fee or Hourly Rate	Added 3x of either base permit Fee or Hourly Rate
20-day	20-day	10-day	3-day	Immediate
10-day	10-day	3-day	Immediate	NA
3-day	3-day	Immediate	NA	NA
Immediate	Immediate	NA	NA	NA

Table 113-G.1.2 All revisions and second/subsequent resubmittals

Initial Service	Added 1x of either base permit Fee or Hourly Rate	Added 2x of either base permit Fee or Hourly Rate	Added 3x of either base permit Fee or Hourly Rate	Added 4x of either base permit Fee or Hourly Rate
20-day	20-day	10-day	3-day	Immediate
10-day	10-day	3-day	Immediate	NA
3-day	3-day	Immediate	NA	NA
Immediate	Immediate	NA	NA	NA

Table 113-G.2

Service delivery for Tier 1 and Tier 2 temporary operational permits from Table 113-D

10 business-day plan review fee	1x base total permit fee	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 10 business days.

5 business-day plan review fee	2x base total permit fee, or base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 10 business days. This fee provides for 5 business-day turnaround of plan review. Applies when event occurs 5 or more business days up to 9 business days after the day of permit application, or when the applicant requests plan review completion 5 or more business days up to 9 business days after the day of permit application.
3 business-day plan review fee	3x base total permit fee, or 2x base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 10 business days. This fee provides for 3 business-day turnaround of plan review. Applies when event occurs 3 or more business days up to 4 business days after the day of permit application, or when the applicant requests plan review completion greater than 3 or more business days up to 4 business days after the day of permit application.
Immediate plan review fee	4x base total permit fee, or 3x base total permit fee plus $80 per hour, which ever is greater	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 10 business days. This fee provides for immediate turnaround of plan review. Applies when event occurs the day of submittal up to 2 business days after the day of permit application after the day of permit application, or when the applicant requests plan review completion the day of submittal up to 2 business days after the day of permit application. Please note this service is subject to staff availability.
First Resubmittal of initial plans sent back with correction comments	$0 for first resubmittal of initial submittal, at the same service level as the initial submittal	For more aggressive service delivery for the first resubmittal, see Table 113-G.2.1 below. Please note that where table calls for either a multiple of the permit fee or the hourly rate, that the lower of the two fees applies
All revisions of approved plans and all second/subsequent resubmittals	1x base total permit fee or the hourly rate times plan review time (whichever is less), at the same service level as the initial submittal	For more aggressive service delivery for all revisions and all second/subsequent resubmittals, see Table 113-G.2.2 below. Please note that where table calls for either a multiple of the permit fee or the hourly rate, that the lower of the two fees applies

Table 113-G.2.1 First Resubmittals

Initial Service	Free Resubmittal	Added 1x of either base permit Fee or Hourly Rate	Added 2x of either base permit Fee or Hourly Rate	Added 3x of either base permit Fee or Hourly Rate
10-day	10-day	5-day	3-day	Immediate
5-day	5-day	3-day	Immediate	NA
3-day	3-day	Immediate	NA	NA
Immediate	Immediate	NA	NA	NA

Table 113-G.2.2 All revisions and second/subsequent resubmittals

Initial Service	Added 1x of either base permit Fee or Hourly Rate	Added 2x of either base permit Fee or Hourly Rate	Added 3x of either base permit Fee or Hourly Rate	Added 4x of either base permit Fee or Hourly Rate
10-day	10-day	5-day	3-day	Immediate
5-day	5-day	3-day	Immediate	NA
3-day	3-day	Immediate	NA	NA
Immediate	Immediate	NA	NA	NA

IFC CHAPTER 2

"202 DELIVERED AUDIO QUALITY (DAQ)" is added to read as follows:

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

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

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

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

DAQ 3.4 (20±5 dB SINAD): Speech understandable with repetition only rarely required; some noise/distortion.
DAQ 4 (25±5 dB SINAD): Speech easily understood; occasional noise/distortion.
DAQ 4.5 (30±5 dB SINAD): Speech easily understood; infrequent noise/distortion.
DAQ 5 (>33 dB SINAD): Speech easily understood.

"202 DONOR ANTENNA" is added to read as follows:

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

"202 DONOR SITE" is added to read as follows:

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

"202 DOWNLINK" is added to read as follows:

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

"202 EMERGENCY RESPONDER RADIO COVERAGE SYSTEM" is added to read as follows:

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

"202 FALSE ALARM" is amended to read as follows:

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

"202 HELISTOP" is amended to read as follows:

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

"202 HIGH-RISE BUILDING" is amended to read as follows:

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

"202 LVMPD" is added to read as follows:

LVMPD – Las Vegas Metropolitan Police Department

"202 Group E, day care facilities" is amended to read as follows:

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

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

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

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

"202 Institutional Group I-4, day care facilities" is amended to read as follows:

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

Adult day care

Child day care

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

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

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

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

"202 Residential Group R-3" is amended to read as follows:

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

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

Boarding houses (nontransient) with 16 or fewer occupants

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

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

Congregate living facilities (nontransient) with 16 or fewer occupants

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

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

"202 SMOKE CONTROL, DEDICATED SYSTEMS" is added to read as follows:

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.

"202 SMOKE CONTROL, NON-DEDICATED SYSTEMS" is added to read as follows:

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.

"202 SOUTHERN NEVADA AREA COMMUNICATIONS COUNCIL (SNACC)" is added to read as follows:

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

"202 UPLINK" is added to read as follows:

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

IFC CHAPTER 3

"307.2 Permit required" is amended to read as follows:

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. 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.

"307.4 Location" is amended to read as follows:

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

Exceptions:

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

"307.4.1 Bonfires" is amended to read as follows:

307.4.1 Bonfires. Bonfires are prohibited.

"307.4.4 Commercial Barbecue" is added to read as follows:

307.4.4 Commercial Barbecue. Barbecue pits used for commercial cooking operations in buildings shall be constructed as commercial food heat-processing equipment in accordance with the Mechanical Code. See also Section 904. Barbecue pits in outdoor locations shall be constructed of concrete or approved noncombustible materials and shall not be located within 10 feet (3048 mm) of combustible walls or roofs or other combustible material.

"308.1.4 Open-flame cooking devices" is amended to read as follows:

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 on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exception: One- and two-family dwellings

"308.1.6.2 Portable fueled open-flame devices" is amended to read as follows:

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

Exceptions:

1. 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.

"308.1.9 Open-flame devices" is added to read as follows:

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.

"308.1.9.1 Prohibited Materials" is added to read as follows:

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

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

"308.1.9.2 Candles, Oil Lamps and Tea Lights" is added to read as follows:

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

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

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

"308.1.9.3 Alcohol Burning Decorative Devices" is added to read as follows:

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

"308.1.9.4 Alcohol Burning Food Warming Devices" is added to read as follows:

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

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

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

"308.1.9.5 Tiki Torches" is added to read as follows:

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

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

"308.3.1 Open-flame decorative devices" is deleted in its entirety.

"314.4 Vehicles" is amended to read as follows:

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.
2. Fuel in fuel tanks does not exceed one-quarter tank of 5 gallons (19 L) (whichever is least)
3. Fuel tanks and fill openings are closed and sealed to prevent tampering
4. Vehicles, aircraft, boats or motorcraft equipment are not fueled or defueled within the building.

"315.3.2.1 Group A occupancies" is added to read as follows:

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

1. Maximum height of storage is 8 feet with top of storage a minimum of 18 inches below sprinkler deflectors.
2. Quick response sprinklers designed per the requirements for an ordinary hazard group II occupancy, or higher design based on the items stored and the proposed storage configuration.

3. Approved permanent durable floor plan(s) showing the assembly use, storage area, corridors and hallways are installed at a location(s) as required by the *fire code official.*
4. Plans approved by the b*uilding code official* identifying the minimum required width of the corridors or hallways.
5. When required by the *fire code official*, a fire protection report shall be submitted addressing the parameters of storage, including protection requirements, separation requirements, and description of commodity type and configuration.

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

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

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

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

"SECTION 319 EXHIBIT AND TRADE SHOWS" is added to read as follows:

SECTION 319

EXHIBITIONS AND TRADE SHOWS

319.1 General. Indoor Exposition and Trade Show Facilities are addressed in this section. These include, but are not limited to exhibition halls, convention general sessions, association meetings, product convention showrooms, trade shows with or without booths, and political conventions that constitute temporary assembly uses. An operational permit shall be obtained in accordance with Section 105.6.

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

319.2.1 Automatic Sprinklers

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

Exception: Where the booth is used in an event with duration less than 7 calendar days and does not contain vehicles, open flame or hot works, automatic fire sprinklers are not required, provided the aggregate area of unsprinklered booths within the room does not exceed 30% of the room size.

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

Exception: Where the booth is used in an event with duration less than 7 calendar days and does not contain vehicles, open flame or hot works, automatic fire sprinklers are not required, provided the aggregate area of unsprinklered booths within the room does not exceed 30% of the room size.

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

319.2.1.4 Hydraulic calculations shall be provided to the Authority Having Jurisdiction when the sprinklers required by Section 319.2.1.1 and 319.2.1.2 are supplied by the standpipe system or in a hydraulically most remote location as defined by the currently adopted edition of Standard for the Installation of Sprinklers, NFPA 13.

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

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

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

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

(1) Noncombustible materials

(2) Wood exceeding ¼ in. (6.3 mm) nominal thickness

(3) Wood that is pressure-treated, fire-retardant wood meeting the requirements of NFPA 703, *Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials.*

(4) Flame-retardant materials complying with NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*

(5) Textile wall coverings, such as carpeting and similar products used in wall or ceiling finishes complying with Section 803.5 of the IFC.

(6) Plastics limited to a Class A flame spread index.

(7) Foamed plastics and materials containing foamed plastics complying with Section 807.4.2.1 of the IFC.

(8) Cardboard, honeycombed paper, and other combustible materials having a heat release rate for any single fuel package that does not exceed 150 kW where tested in accordance with UL 1975, *Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes*.

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

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

319.3 Decorative Curtains, and Textiles

319.3.1 Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 319, and shall not be required to comply with Section 807. Curtains, drapes and textiles shall comply with Standard Method of Fire Tests for Flame Propagation of Textiles and Films, NFPA 701, Test Method 2. Compliance shall be indicated by a tag affixed to each curtain, drape, or textile. The tag shall be affixed by the owner of the material after gaining assurance that the material is inherently flame retardant, provided with current flame retardant treatment, or otherwise is compliant with NFPA 701. The tag shall indicate the name of the owner of the material and a statement indicating compliance with the Fire Code. The fire code official is authorized to conduct field test in accordance with the current edition of NFPA

705, *Recommended Practice for a Field Flame Test of Textiles and Films*, on any curtain, drape or textile installed.

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

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

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

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

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

319.3.5 The amount of temporary ceiling hung curtains, drapes or textiles in exhibition spaces equipped throughout with automatic sprinklers shall not be limited and shall comply with 319.3.1 through 319.3.3.

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

1. All cooking appliances shall be listed or approved by a nationally recognized testing agency.
2. All cooking equipment is to be operated according to the manufacturers' recommendations and operating instructions. Equipment recommended for outdoor use shall not be used indoors.
3. All cooking equipment (deep fat fryers and woks) operations using combustible oils shall meet all of the following criteria:
    a. Metal lids sized to cover the horizontal cooking surface are to be provided.
    b. The cooking surface is limited to 288 sq in (two sq ft).
    c. Cooking equipment exceeding 288 sq in aggregate surface area shall be provided with an automatic extinguishing system installed according to NFPA 17A.
    d. Cooking equipment exceeding 288 sq in shall be provided with a mechanical exhaust system in accordance with the mechanical code.
    e. The fryer is to be separated from all other equipment by a distance not less than 24 in.
    f. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
    g. The volume of cooking oil per appliance is not to exceed 3 gal.
    h. The volume of cooking oil per booth is not to exceed 8 gal.
    i. Deep fat fryers shall be electrically powered and have a shut-off switch.
4. Class-K fire extinguishers shall be provided within 30-ft of each cooking operation in accordance with 904.11.5.
5. Solid fuel cooking equipment shall be protected in accordance with the mechanical code.

6. LP-gas used for displays and demonstrations shall be in accordance with section 6103.2.1.5.

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

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

"SECTION 320 PALLETS" is added to read as follows:

SECTION 320 PALLETS

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

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

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

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

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

320.6 Idle Pallet Storage

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

1. Stacks shall not exceed a height of fifteen (15) ft. (4.57 m) or any height restriction set by other ordinances of the jurisdiction, whichever is lower.
2. Stacks shall be no closer than eight (8) ft. (2.44 m) to any property line or a distance equal to the stack height, whichever is greater.
3. Stacks shall be no closer than eight (8) ft. (2.44 m) to any other on-site storage.

4. Stacks shall be no closer than fifteen (15) ft. (4.57 m) to any on-site structure.
5. Stacks shall be arranged to form stable piles.
6. Piles shall not contain more than six thousand (6,000) cu. ft. (170 m^3) of pallets.
7. Piles shall be separated by a minimum distance of eight (8) ft. (2.44 m).
8. Piles shall be arranged in a grid system to form pallet storage arrays with a maximum dimension of fifty (50) ft. by fifty (50) ft. (15.25 m by 15.25 m).
9. Pallet storage arrays shall be separated by a minimum distance of twenty four (24) ft. (7.32 m).

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

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

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

"SECTION 321 SPECIAL ACTIVITY LOTS" is added to read as follows:

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.

"SECTION 322 FILMING" is added to read as follows:

SECTION 322
MOTION PICTURE AND TELEVISION PRODUCTION STUDIO, SOUND STAGES, PRODUCTION FACILITIES, AND PRODUCTION LOCATIONS

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

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

Exceptions:

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

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

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

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

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

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

322.6 Temporary Production Locations

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

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

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

Exceptions:

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

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

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

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

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

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

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

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

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

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

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

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

IFC CHAPTER 4

"401.3.2 Alarm activations" is amended to read as follows:

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

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

"401.9 Fees for false alarms and nuisance alarms" is added to read as follows:

401.9 Fees for false alarms and nuisance alarms. In the case of any two false or nuisance alarms, or combination thereof, within a consecutive thirty day period, the fire code official may issue warning notices to the owners or occupants of the building and to the alarm business or businesses responsible for the service, maintenance and monitoring of the system. This notice shall indicate that any additional false or nuisance alarms within a thirty day period will be subject to the fees prescribed in this code. When the owner or occupant fails to correct the fire protection system that initiates the false alarm and/or nuisance alarms within thirty calendar days from the issue date on a Notice of Violation prepared by the Fire Prevention Bureau, additional inspection fees shall apply.

"403.2 Public safety plan" is amended to read as follows:

403.2 Public safety plan. Where the fire code official or the Fire Chief determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the fire code official or the Fire Chief shall have the authority to order the development of, or prescribe a plan for, the provision of an approved level of public safety.

IFC CHAPTER 5

"502.1 Definitions" is amended to read as follows:

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

AGENCY.

DELIVERED AUDIO QUALITY (DAQ).

DONOR ANTENNA.

DONOR SITE.

DOWNLINK.

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM.

FIRE APPARATUS ACCESS ROAD.

FIRE COMMAND CENTER.
FIRE DEPARTMENT MASTER KEY.
FIRE LANE.
KEY BOX.
LAS VEGAS METROPOLITAN POLICE DEPARTMENT (LVMPD).
SOUTHERN NEVADA AREA COMMUNICATIONS COUNCIL (SNACC).
TRAFFIC CALMING DEVICES.
UPLINK.

"503.1.1 Buildings and facilities" is amended to read as follows:

503.1.1 Buildings and facilities. *Approved* fire apparatus roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

Exception: The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where:

1. The building, except for a Group H and/or high-pile storage occupancy, is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, 903.3.1.2, or 903.3.1.3.
   a. Where the building is protected with an approved automatic sprinkler system in accordance with minimum requirements, the fire apparatus roads shall extend to within 250 feet (76 420 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building.
   b. Where the building is protected with an approved upgraded automatic sprinkler system in accordance with the minimum requirements for the upgraded sprinkler system design, the fire apparatus roads shall extend to within 350 feet (106 680 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building. For the purposes of this section, an upgraded sprinkler system shall be in accordance with the following table:

Minimum Code-Required System	Upgraded System for 350 feet from fire apparatus lanes
NFPA 13D	NFPA 13R
NFPA 13R	NFPA 13, Light Hazard
NFPA 13, Light Hazard	NFPA 13, Ordinary Hazard Group 1, with quick-response sprinklers
NFPA 13, Ordinary Hazard Group 1	NFPA 13, Ordinary Hazard Group 2
NFPA 13, Ordinary Hazard Group 2	NFPA 13, Extra Hazard Group 1
NFPA 13, Extra Hazard Group 1	NFPA 13, Extra Hazard Group 2
NFPA 13, Extra Hazard Group 2	As approved by the *fire code official*

2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.
3. There are not more than two Group R-3 or Group U occupancies or single-family dwellings built under the IRC.

4. For buildings constructed in accordance with high-rise provisions, fire access along two adjoining sides of the building shall be permitted.

"503.2.1 Dimensions" is amended to read as follows:

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

503.2.1.1 Parallel Parking Permitted on Both Sides. Where parallel parking is permitted on both sides of the fire apparatus access road, the minimum clear width of the fire apparatus road shall be shall be 36 feet (10 972 mm), measuring 37 feet (11 277 mm) from back-of-curb to back-of-curb for L curbs and 39 feet (11 887 mm) from back-of-curb to back-of-curbs for roll curbs.

503.2.1.2 Parallel Parking Permitted on One Side Only, Commercial Only. For commercial developments where parallel parking is permitted only on one side of the apparatus road, the minimum clear width of the fire apparatus road shall be 30 feet (9144 mm), measuring 31 ft (9448 mm) from back-of-curb to back-of-curb for L curbs, or 33 ft (10058 mm) from back-of-curb to back-of-curb for roll curbs. Parallel parking on one side only for the purpose of narrowing the roadway width is not permitted for fire apparatus roads serving one- and two-family dwellings. Fire lane markings, provided in accordance with Section 503.3, shall be provided on the side of the road where parallel parking is prohibited.

503.2.1.3 Parallel Parking Prohibited on Both Sides, Commercial Only. For commercial developments where parallel parking is prohibited on both sides of a fire apparatus road, the minimum clear width of the fire apparatus road shall be 24 feet (7315 mm), measuring 25 ft (7620 mm) from back-of-curb to back-of-curb for L curbs, or 27 ft (8229 mm) from back-of—curb to back-of-curb for roll curbs. The prohibition of parallel parking on both sides for the purpose of narrowing the roadway width is not permitted for fire apparatus roads serving one- and two-family dwellings. Fire lane markings, provided in accordance with Section 503.3, shall be provided on both sides of the road where parallel parking is prohibited.

503.2.1.4 Parking Lot Drive Aisles. Where fire apparatus access roads pass though parking lots consisting of marked perpendicular and angled parking spaces, such fire apparatus access roads shall have a minimum clear width of 24 feet (7315 mm), as measured from the edges of the marked parking spaces.

503.2.1.5 Stub Streets. For Group R, Division 3 structures and for structures constructed in accordance with the IRC, roads serving a maximum of 6 residences and having a maximum length of 150 feet, as measured from the intersection to the back of curb at the end of the stub street, may front onto a stub street with a minimum width of 25 feet from back-of-curb to back-of-curb, provided that all residences fronting on the stub street are provided with an approved automatic sprinkler system and that on-street parking on the stub street is prohibited.

"503.2.3 Surface" is amended to read as follows:

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

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

"503.2.4 Turning radius" is amended to read as follows:

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

"503.2.7 Grade" is amended to read as follows:

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

"503.2.8 Angles of approach and departure" is amended to read as follows:

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall be a maximum of 6 percent grade for 25 feet (7.6 m) of approach/departure.

"503.3.3 Marking" is amended to read as follows:

503.3 Marking. Fire apparatus access roads shall be marked where required to prohibit parking and other obstructions. Marking shall consist of painting the curb, or the side of the street, where no curb is present, with a suitable coat of industrial red enamel along the entire length of road where parking is prohibited. Each section of curb that is painted red shall also be marked by signage stating "NO PARKING FIRE LANE" (Type A sign). Signs are to be installed no higher than 10 feet or less than 6 feet from the surface of the roadway. Signs shall be located at each end of painted curb, and additionally in between so that the maximum separation between signs is 100 feet, as measured along the centerline of the fire apparatus access road.

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

503.3.1 Sign Specifications. Where required by the *Fire Code Official* signs shall be in accordance with the following:

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

"FIRE LANE"

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

"ON STREET PARKING IN MARKED FIRE LANES PROHIBITED"

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

"NO PARKING FIRE LANE"

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

TYPE A SIGN

ON-STREET PARKING
IN MARKED
FIRE LANES
PROHIBITED

TYPE B SIGN

TYPE C SIGN

"503.4.1 Traffic calming devices" is amended to read as follows:

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

Exceptions:

1. 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*.
2. Rumble strips are allowed on any private fire apparatus access road serving residential, commercial and industrial buildings when approved by the *fire code official*. A rumble strip must be no higher than ¾ inches at the highest elevation above the roadway, and a maximum of eight feet in length, as measured along the direction of vehicle travel.

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

"503.6 Access Gates" is amended to read as follows:

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

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

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

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 Prevention Bureau guidelines. Non-complying gates shall be secured in the open position in a manner approved by the Fire Prevention Bureau.

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.

"505.1 Address Identification" is amended to read as follows:

505.1 Address Identification. New and existing buildings shall have *approved* address numbers, building numbers or *approved* building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall

contrast with their background. Where required by the *fire code official*, address numbers shall be provided in additional *approved* locations to facilitate emergency response. Address numbers shall be Arabic numerals or alphabet letters. Address identification shall be in compliance with the requirements of the *fire code official* and the ordinances of the jurisdiction. Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole, or other sign or means shall be used to identify the structure. Address numbers shall be maintained.

"505.3 Directory required" is added to read as follows:

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

"507.1 Required water supply" is amended to read as follows:

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

Exception: Highly treated effluent reuse water that meets or exceeds the State of Nevada Administrative Code (NAC) "Uncontrolled - Full Body Contact Expected" reuse water criteria is allowed when approved by the Fire Code Official. At a minimum, highly treated effluent reuse water shall meet or exceed a 30-day geometric means which is less than or equal to 2.2 c.f.u. or m.p.n./100 ml, and Max Daily Number less than or equal to 23 c.f.u. or m.p.n./100 ml for Total Coliforms. The applicant shall show that access to an adequate potable water supply or source is not possible to the satisfaction of the Chief. A written "fire suppression water quality assurance plan" shall be submitted and approved by the Chief prior to construction and/or use of highly treated effluent reuse water as a source of water supply for fire hydrants and fire sprinkler systems.

"507.4 Water supply test" is amended to read as follows:

507.4 Water supply test. The fire code official shall be notified prior to the water supply test. Water supply tests shall be witnessed by the fire code official prior to final approval of the water supply system.

"507.4.1 Fire flow test" is added to read as follows:

507.4.1 Fire flow test. A water supply test shall be conducted to prove that the fire flow required by Appendix B is provided. Fire flow tests shall be witnessed by the fire code official. Fire flow tests shall be conducted in accordance with NFPA 291 and this section. The procedures for conducting a fire flow test are as follows:

1. Obtain appropriate permit approvals
2. Schedule an inspection with Clark County Fire Prevention
3. Coordinate layout of fire flow test with Clark County Fire Prevention

4. Select a hydrant for pressure readings. This hydrant is referred to as a "gauge hydrant". For dead-end supply situations, this hydrant shall be closer to the point of water supply.
5. Attach a pressure gauge to the gauge hydrant. Measure static pressure.
6. Select a fire hydrant for flow. This hydrant is referred to as a "flow hydrant". For dead-end supply situations, this hydrant shall be further from the point of water supply.
7. Flow one or more outlets of the flow hydrant to provide a sufficient drop in pressure at the gauge hydrant. A minimum pressure drop of 25% of the static pressure or 10 PSI, whichever is less, is required. Should the pressure at the gauge hydrant not drop the minimum required pressure, with all three outlets of the flow hydrant flowing, then compliance with the minimum pressure drop is not required.
8. After having achieved the desired drop in pressure at the gauge hydrant, conduct pitot readings for each outlet flowing at the flow hydrant.
9. Record the static pressure, residual pressure, and pitot pressure reading for each outlet flowed.
10. Calculate flows using the procedures of NFPA 291, utilizing a factor of 0.9 for each outlet, and the additional factor required for the pumper outlet.
11. Calculate the expected flow at a residual pressure of 20 psi, using the formula of NFPA 291.

"507.4.2 Sprinkler design flow test" is added to read as follows:

507.4.2 Sprinkler design flow test. . A sprinkler design flow test shall be conducted to the water supply available for design of new sprinkler systems. Sprinkler design flow tests used for sprinkler system design shall be within 12 months prior to submittal of the fire sprinkler permit. Sprinkler design flow tests shall be witnessed by the fire code official. Sprinkler design flow tests shall be conducted in accordance with NFPA 291 and this section. The procedures for conducting a sprinkler design flow test are as follows:

1. Obtain appropriate permit approvals
2. Schedule an inspection with Clark County Fire Prevention
3. Coordinate layout of fire flow test with Clark County Fire Prevention
4. Select a hydrant for pressure readings. This hydrant is referred to as a "gauge hydrant". For dead-end supply situations, this hydrant shall be closer to the point of water supply.
5. Attach a pressure gauge to the gauge hydrant. Measure static pressure.
6. Select a fire hydrant for flow. This hydrant is referred to as a "flow hydrant". For dead-end supply situations, this hydrant shall be further from the point of water supply.
7. Flow one or more outlets of the flow hydrant to provide a sufficient drop in pressure at the gauge hydrant. A minimum pressure drop of 25% of the static pressure or 10 PSI, whichever is less, is required. Should the pressure at the gauge hydrant not drop the minimum required pressure, with all three outlets of the flow hydrant flowing, then compliance with the minimum pressure drop is not required.
8. After having achieved the desired drop in pressure at the gauge hydrant, conduct pitot readings for each outlet flowing at the flow hydrant.
9. Record the static pressure, residual pressure, and pitot pressure reading for each outlet flowed.
10. Calculate flows using the procedures of NFPA 291, utilizing a factor of 0.9 for each outlet, and the additional outlet required for the pumper outlet.

11. Include a copy of the Clark County Fire Prevention inspection report with the fire sprinkler system submittal.

"507.5.7 Painting and Markings" is added to read as follows:

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

507.5.7.1 Hydrant Painting. 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.

"507.5.8 Hydrant locks on private hydrants" is added to read as follows:

507.5.8 Hydrant locks on private hydrants. Hydrant locks that are approved by the hydrant manufacturer are permitted to be installed on private hydrants for the purposes of securing private hydrants to prevent theft of water.

"508.1.3 Size" is amended to read as follows:

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

"508.1.5 Required features" is amended to read as follows:

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

1. The emergency voice/alarm communication control unit.
2. The fire department communication system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicator and controls for air distribution systems, including smoke removal systems where required by Section 403.4.7 of the International Building Code.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting

equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.

13. An *approved* Building Information Card that contains, but is not limited to, the following information:
    - 13.1 General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), estimated building population (i.e., day, night, weekend);
    - 13.2 Building emergency contact information that includes: a list of the building's emergency contacts (e.g, building manager, building engineer, etc.) and their respective work phone number, cell phone number, and e-mail address;
    - 13.3 Building construction information that includes: the type of building construction (e.g., floors, walls, columns, and roof assembly);
    - 13.4 Exit stair information that includes: number of *exit stair*s in the building, each *exit stair* designation and floors served, location where each *exit stair* discharges, *exit stair*s that are pressurized, *exit stair*s provided with emergency lighting, each *exit stair* that allows reentry, *exit stair*s providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve, location of elevator machine rooms, location of sky lobby, location of freight elevator banks;
    - 13.5 Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service;
    - 13.6 *Fire protection system* information that includes: locations of standpipes, location of fire pump room, location of fire department connections, floors protected by *automatic* sprinklers, location of different types of *automatic sprinkler systems* installed (e.g, dry, wet, pre-action, etc.); and
    - 13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.
14. A new work table with a minimum size of three (3) feet by seven (7) feet capable of holding plans in an open position.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1.
18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
19. An approved white board with a minimum size of three (3) feet by four (4) feet capable of easy erasure, with a marking device and an eraser attached.
20. Separate shunt trip switches for normal and emergency power.
21. A printer connected to the fire alarm control panel to record all fire alarm, supervisory and trouble signals. The printer shall be connected either to a UPS battery system and/or an emergency power supply.

"SECTION 510 EMERGENCY RESPONDER RADIO COVERAGE SYSTEM" is amended to read as follows:

SECTION 510
EMERGENCY RESPONDER RADIO COVERAGE SYSTEM

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

Exceptions:

1. Where it is determined by the *fire code official* that the radio coverage system is not needed.
2. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.

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

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

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

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

Exceptions:

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

510.3 Permits required. Construction and operational permits shall be required as set forth in Section 105.6 and 105.7.

510.3.1 Construction documents. Construction documents for emergency responder radio coverage systems shall be of sufficient clarity to indicate the location, nature and extent of the

work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations as determined by the *fire code official*.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type/IP65 waterproof cabinet.
2. The battery system shall be contained in a NEMA 3-type or NEMA 4-type/IP65 waterproof cabinet.

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

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

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

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

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

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

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

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

510.4.2.5.2.6 Cable.

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

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

510.4.2.5.2.7 Splitters. Only fixed value splitters shall be used.

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

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

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

510.5.1 Approval prior to installation. No amplification system capable of operating on frequencies or causing interference on frequencies assigned or licensed to any public safety

agency by the FCC shall be installed without prior coordination and approval of the *fire code official*. The building manager/owner shall suspend and correct other equipment installations that degrade the performance of the public safety radio system or emergency responder radio coverage system.

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

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

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

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

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

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

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

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

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

1. Each 100,000 square foot sector of the building floor shall be divided into a grid of 40 approximately equal areas. The maximum grid dimension shall be 50 feet, and the maximum grid size shall be 2,500 square feet.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system and a calibrated signal level recording system. Measurements of DAQ and signal strength shall be made in each grid area.
3. Failure of a maximum of two nonadjacent test areas shall not result in failure of the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the grid resolution may be doubled, so that each 100,000 square foot sector of each floor may be divided into 160 equal areas, each having a maximum dimension of 25 feet and a maximum area of 625 square feet. A maximum of eight nonadjacent areas shall be allowed to fail the test. If the system fails the 160-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications through the public agency's radio communications system. Once the test location has been selected, that

location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.

6. Measurements shall be made with the antenna held in a vertical position at three (3) to four (4) feet above the floor. (Portable radio worn on the belt or turnout coat pocket).
7. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.
8. When required by *fire code official* input signals may use a talkbox in accordance with NFPA 72 annex-D or similar input signal.
9. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject installation and subsequent annual inspections.
10. A sweep test to measure the level of RF radiation shall be conducted to verify that the system complies with FCC OET 65 Standards.

    Exception: FCC compliant DAS systems.

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

1. Each 100,000 square foot sector of the building floor shall be divided into a grid of 40 approximately equal areas. The maximum grid dimension shall be 50 feet, and the maximum grid size shall be 2,500 square feet.
2. All grids shall pass the test (failure is not an option).
3. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system and a calibrated signal level recording system. Measurements of DAQ and signal strength shall be made in each grid area.
4. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
5. Measurements shall be made with the antenna held in a vertical position at three (3) to four (4) feet above the floor. (Portable radio worn on the belt or turnout coat pocket).
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject installation and subsequent annual inspections.
8. When required by *fire code official* input signals may use a talkbox in accordance with NFPA 72 annex-D or similar input signal.
9. A sweep test to measure the level of RF radiation shall be conducted to verify that the antennae system complies with FCC OET 65 Standards.

    Exception: FCC compliant DAS systems.

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

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

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

510.6.1 Annual Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

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

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

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

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

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

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

510.6.5 Fire Department Radios. The owner shall provide the fire department with portable radios in accordance with this section.

510.6.5.1 Number of radios. A minimum of two radios, and no less than one radio for every 1 million square feet of building area, shall be provided to the fire department.

510.6.5.2 Radio model. Radios shall be approved by the *fire code official*.

510.6.5.3 Warranty and ownership transfer. Warranty and ownership of the radios shall be transferred to the fire department upon successful completion of the acceptance test.

IFC CHAPTER 6

"603.1.4 Fuel oil" is amended to read as follows:

603.1.4 Fuel oil. The grade of fuel oil used in a burner shall be that for which the burner is approved and as stipulated by the 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.

"603.3.2.1 Quantity limits" is amended to read as follows:

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

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

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

"603.3.2.2 Restricted use and connection" is amended to read as follows:

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.

"606.1 Scope" is amended to read as follows:

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

"606.5 Access" is amended to read as follows:

606.5 Access. Refrigeration systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be accessible to the fire department at all times as required by the *fire code official*.

"606.6 Testing of equipment" is amended to read as follows:

606.6 Testing of equipment. Refrigeration equipment and systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be subject to periodic testing in accordance with section 606.6.1. A

written record of required testing shall be maintained on the premises. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

"606.7 Emergency signs" is amended to read as follows:

606.7 Emergency signs. Refrigeration units or systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code shall be provided with *approved* emergency signs, charts, and labels in accordance with NFPA 704. Hazard signs shall be in accordance with the *International Mechanical Code* for the classification of refrigerants listed herein.

"606.11 Storage, use and handling" is amended to read as follows:

606.11 Storage, use and handling. Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 11-1 of the Uniform Mechanical Code. Storage use or handling of extra refrigerant of refrigerant oils shall be as required by Chapters 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.

"607.1 Emergency operation" is amended to read as follows:

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

"609.3.5 Access panel coordination" is added to read as follows:

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

"609.3.6 Automatic sprinkler location" is added to read as follows:

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

IFC CHAPTER 8

"806.1.1 Restricted occupancies" is amended to read as follows:

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

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

"807.1 General requirements" is amended to read as follows:

807.1 General requirements. In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other *decorative materials* suspended from walls or

ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

Exceptions:

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

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

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

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

"807.4.1 General" is amended to read as follows:

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

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

IFC CHAPTER 9

"901.2.2" is added to read as follows:

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

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

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

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

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

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

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

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

"901.2.3 Plans" is added to read as follows:

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

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

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

"901.4.3 Fire areas" is deleted in its entirety.

"901.4.6 Pump and riser room size" is amended to read as follows:

901.4.6 Pump and riser room size. Fire pump and automatic sprinkler system riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Working space with a minimum clearance of 36 inches shall be provided around a minimum of three sides of the fire pump and to the front approach of all fire sprinkler risers, with a connected path to the entrance door to the space. 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 a door(s) and an unobstructed passageway large enough to allow removal of the largest piece of equipment.

"901.6 Inspection, testing and maintenance" is amended to read as follows:

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

"901.6.2 Records" is amended to read as follows:

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

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

"901.6.3 Authority to Audit" is added to read as follows:

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

"901.6.4 Contractor Licensing" is added to read as follows:

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

"901.6.5 Service Contract" is added to read as follows:

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

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

1. Prior to the inspection, testing or maintenance of a fire protection system, the Fire Dispatch Center shall be notified by the company of the location of the test and the approximate time that the system will be out of service. Upon completion, the Fire Dispatch Center shall be notified that the system has been returned to service.
2. Perform all inspections and testing methods in accordance with applicable National Fire Protection Association (NFPA) Standards and the Nevada State Fire Marshal Regulations (NAC 477).
3. Provide a copy of the inspection report to the owner or owner's designee with 2 business days from the completion of the inspection.
4. Upon receipt of a discrepancy report, the owner shall correct such discrepancies within 30 calendar days. If the discrepancies are not corrected by the end of this 30-day period, the maintenance contractor shall submit the discrepancy report to the fire code official within 2 business days after the 30-day period expires.
5. Comply with the requirements of 901.7 whenever the testing or inspection reveals that the system has been disabled or is out of service.
6. Notify the *fire code official* in writing in accordance with NAC 477.349.
7. Comply with the requirements of sections 901.6, 901.7 and 901.9 as applicable.

"901.7 Systems out of service" is amended to read as follows:

901.7 Systems out of service. Where a required fire protection system is out of service, the fire department and the fire code official shall be notified immediately in accordance with Appendix L and, where required by the fire code official, the building shall either be evacuated, provided with other mitigation as required by the fire code official, or an approved fire watch shall be provided for all occupants left unprotected by the shutdown until the fire protection system has been returned to service.

Where utilized, fire watches shall be provided with at least one approved means for notification of the fire department, shall meet the requirements sets forth in Appendix L, and their only duty shall be to perform constant patrols of the protected premises and keep watch for fires.

In all instances where systems are out of service, either due to a planned or an emergency impairment, fire systems maintenance contractors shall be notified to respond to the site. Fire systems maintenance contractors shall assess the impairment, determine the time needed to execute repairs, and notify the impairment coordinator, and fire department and the fire code official as required by Appendix L, of the repair time needed.

"901.10 Recall of fire protection components" is amended to read as follows:

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

"903.1.1 Alternative protection" is deleted in its entirety.

"903.2 Where required" is amended to read as follows:

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

Exceptions:

1. Open parking garages with no other occupancy above the open parking garage structure are not required to be protected with automatic sprinklers.
2. 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 on more than one side with any walls along any portion of the perimeter of the structure, 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 Commission, a State of Nevada charter, or other public franchise. This exception does not apply to non-exempted buildings or structures containing occupiable spaces such as offices, meeting rooms, service counters, public restrooms, or other normally occupied spaces.
4. Canopy structures 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 sq. ft. in horizontal area, do not require fire sprinklers.
5. For new construction expanding an existing unsprinklered Group R-3 occupancy or single-family occupancy built under the IRC, sprinklers are not required to be retrofitted into the building where the building is provided with fire flow in accordance Appendix B.

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

Exceptions:

1. Where a building is subdivided into separate buildings, each having a total building area of less than 5,000 sq ft (464 m^2), by 4-hour rated fire walls with no openings constructed in accordance with the IBC.
2. Special hazard areas that require sprinklers for certain uses, such as medical gas rooms, may be fire sprinklered without requiring additional fire sprinklers, when approved by the code official.

"903.2.3 Group E" is amended to read as follows:

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

1. The Group E *fire areas* have an occupant load of 50 or more.
2. Any portion of the Group E fire areas is below the lowest *level of exit discharge.*
3. Rooms used for kindergarten, first or second-grade pupils or for child care purposes, are located above or below the first story.
4. Daycare facilities where there is occupancy from 12:00 AM - 6:00 AM.

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

"903.2.11.5 Commercial cooking operations" is amended to read as follows:

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

"903.2.11.7 Protection of available storage height" is amended to read as follows:

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

"903.3.1.1.1 Exempt locations" is amended to read as follows:

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

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

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

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

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

"903.3.1.2 NFPA 13R sprinkler systems" is amended to read as follows:

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

"903.3.5.2 Secondary water supply" is amended to read as follows:

903.3.5.2 Secondary water supply. An automatic dedicated secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including a 100 gpm inside hose stream requirement, but not less than 15,000 usable gallons, shall be provided for high-rise buildings. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum 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.

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

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

"903.3.8 Cross connections and backflow, minimum types of protection" is added to read as follows:

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

"903.4 Sprinkler system supervision and alarms" is amended to read as follows:

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

Exceptions:

1. Automatic sprinklers systems protecting one- and two-family dwellings
2. Limited area systems serving fewer than 20 sprinklers.
3. Automatic sprinklers systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.

5. Control valves to 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.

"903.4.1 Monitoring" is amended to read as follows:

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

Exceptions:

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

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

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

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

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

"903.4.2 Audible and Visual Notification appliances" is amended to read as follows:

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

"903.4.3 Floor control valves" is amended to read as follows:

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

"903.7 Automatic Sprinkler in Existing Buildings" is added to read as follows:

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

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

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

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

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

Exceptions:

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

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

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

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

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

Exceptions:

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

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

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

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

Exceptions:

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

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

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

existing building by 4-hour rated *fire walls* constructed in accordance with Section 706, and without openings.

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

"904.2 Where required" is amended to read as follows:

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

"904.11.6.2 Extinguishing system service" is amended to read as follows:

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

"905.3.1 Height" is amended to read as follows:

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

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

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

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

"905.3.3 Covered and open mall buildings" is amended to read as follows:

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

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

2. At each floor-level landing within enclosed stairway opening directly on the mall.

3. At exterior public entrances to the mall of a covered mall building

4. At public entrances at the perimeter line of an open mall building

5. Throughout the entire mall building so that all portions of each floor level, including all portions of a tenant space, are provided with hose valve coverage utilizing 100 feet (30 480 mm) of hose and 30-foot (9144 mm) stream from any hose connection located on that floor or

intermediate landing. The length of hose shall be along normal walking routes, and the stream shall not be expected to penetrate walls or windows.

"905.3.9 Building area" is added to read as follows:

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

"905.4 Location of Class I standpipe hose connections" is amended to read as follows:

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

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located on the floor landing, as approved by the authority having jurisdiction.
2. On each side of the wall adjacent to the exit opening of a horizontal exit

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

   Exception: Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.
4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), each standpipe shall be provided with a hose connection located to serve the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.16.
6. Throughout the entire building so that all portions of each floor level are provided with hose valve coverage utilizing 100 feet (30 480 mm) of hose and 30-foot (9144 mm) stream from any hose connection located on that floor or intermediate landing. The length of hose shall be along normal walking routes, and the stream shall not be expected to penetrate walls or windows.

"905.4.1 Protection" is amended to read as follows:

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

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

"905.5 Location of Class II standpipe hose connections" is amended to read as follows:

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

"905.5.3 Class II system I inch hose" is deleted in its entirety.

"905.9 Valve supervision" is amended to read as follows:

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

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

"906.2 General requirements" is amended to read as follows:

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

Exceptions:

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

"907.1 General" is amended to read as follows:

"907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.9 are applicable to existing buildings and structures. An integrated campus system shall not supplant the fire alarm system requirements in new buildings and structures. Supplemental integrated campus systems may be allowed subject to the approval of the *fire code official*. When approved by the *fire code official* supplemental

integrated campus systems circuits shall utilize class A, style 7, weatherproof raceway and wiring methods."

"907.1.2 Fire alarm shop drawings" is amended to read as follows:

907.1.2 Fire alarm shop drawings. Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation. Where the installation changes from the approved shop drawings, corrected shop drawings showing the system as actually installed shall be submitted for review and approval prior to inspection. Shop drawings shall include the following as required by the *fire code official*:

1. Project name, street address and owner's name.
2. Contractor name, address, phone number, license numbers, license classification, and license limit.
3. Wet/electronic signature of licensee (contractor's Master or Qualified Employee).
4. Wet/electronic signature of the NICET designer or Nevada Registered Fire Protection Engineer who prepared the plan, drawing and calculations. For plans prepared by a NICET designer, the designer's printed name and certificate number shall follow the signature.
5. Occupancy classification. For all occupancies, state the occupant load.
6. Fire alarm circuit classification (power-limited or non-power-limited).
7. Class designation of all initiating device circuit (IDC), signaling line circuits (SLC), and notification appliance circuits (NAC).
8. Conductor type and size.
9. Sequence of operation input/output matrix as required by NFPA 72.
10. Symbol legend with equipment description (manufacturer's name and model number) and mounting description (surface, semi-flush, flush, and exterior).
11. When required by the *fire code official* symbols used on the shop drawings shall follow the most current edition of NFPA 170,.
12. Site plan.
13. Floor plan drawn to an indicated scale (1/8" minimum) on sheets of a uniform size showing:
    a. Point of compass (north arrow).
    b. A graphic representation of the scale used on all plans.
    c. Walls, doors, windows, openings, stairs, elevators, passageways, high piled storage racks, etc., as applicable to depict the facility.
    d. Room use identification labels.
    e. Alarm initiating device, notification appliance, and auxiliary controlled or monitored equipment and systems, control and annunciation equipment location (s).
    f. Conductor/conduit routing and size.
    g. Location of end-of-line resistors.
    h. Zone identification (conventional system).
    i. Device addresses (addressable systems).
    j. Notification appliance numbering by circuit and device corresponding to the riser and/or one line diagrams.
    k. Power panels and circuit connections.
    l. Key plan.

m. Ceiling heights, and construction (i.e., beam, joist, soffit, or other projection extending below the ceiling when a ceiling mounted device and/or appliance is used).

14. Mounting height detail for wall mounted device and/or appliance.
15. Riser diagram including the following information:
    a. General arrangement of the system, in building cross-section.
    b. Wall/shaft/stairwell and/or cable ratings when survivability or class A requirements apply.
    c. Type and number of circuits in each riser.
    d. Type and number of fire alarm system components/devices on each circuit, on each floor or level.
16. Emergency voice/alarm communication system plans shall: graphically and in tabular form designate acoustically distinguishable spaces; indicate where intelligibility testing is required and where intelligibility testing is not required
17. *Fire code official* standard shop drawing notes.
18. Standardized calculations (shown on the plans unless otherwise approved):
    a. Battery (all panels).
    b. Load (all notification appliance and auxiliary circuits).
    c. Voltage drop (all notification appliance circuits, including remote annunciators and auxiliary appliances).
    d. Speaker power loss calculations
19. Addressable device list with *approved* alpha numeric descriptor for each device when required by the *fire code official*
20. Product data submittal including a cover index sheet listing products used by make and model number, manufacturer data sheets and listing information for all equipment, devices, materials, wire and cable.
21. Design number and detail of penetration fire stop system when required.
22. Any additional information determined necessary by the *fire code official*.

"907.1.4 Signage" is added to read as follows:

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*.

"907.2 Where required-new buildings and structures" is amended to read as follows:

907.2 Where required-new buildings and structures. An *approved* fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.24 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

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

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

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

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

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

"907.2.1 Group A" is amended to read as follows:

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

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

"907.2.3.1 Locking manual pull stations" is added to read as follows:

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

1. Approval of the *fire code official* shall be obtained prior to any conversions or installation. The Key operated devices shall be a listed "institutional" type and not a field modified device.
2. All school staff members shall be trained in the operation of the key operated devices and shall receive a key with obvious markings, for operating the manual pull station. Staff members shall have their key at all times while on school property.
3. The school official shall collect training reports verifying that staff has had training on a quarterly basis and shall be available for review by the f*ire code official* upon request.
4. The Fire Department or Prevention Bureau may conduct unannounced drills or training.
5. Unacceptable performance as evaluated by the f*ire code official* may result in a requirement to convert the devices back to traditional type.

"907.2.7.1 Occupant notification" is deleted in its entirety

"907.2.8.2 Automatic smoke detection system" is amended to read as follows:

907.2.8.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior *corridors* serving *sleeping units*. For the purposes of this section, interior means a conditioned space.

Exception: An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit* has a

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

"907.2.9.1 Manual fire alarm system" is amended to read as follows:

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

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

Exceptions:

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

"907.2.9.1.1 Automatic smoke detection system" is added to read as follows:

907.2.9.1.1 Automatic smoke detection system. When a fire alarm system is required, an automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior corridors serving 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.

"907.2.13 High-rise buildings" is amended to read as follows:

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

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.5 of the *International Building Code*.
3. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.

"907.2.13.1.1 Area smoke detection system" is amended to read as follows:

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

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

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

"907.2.13.1.3 System smoke detection with sounder bases" is added to read as follows:

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

"907.2.13.2 Fire department communication system" is amended to read as follows:

907.2.13.2 Fire department communication system. Where a wired communication system is provided in addition to a radio coverage system in accordance with Section 510, the wired fire department communication system shall be designed and installed in accordance with NFPA 72 using warden stations and shall operate between a *fire command center* complying with Section 508, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed *exit stairways* and other locations as required by the *fire code official*. The fire department communication device shall be provided at each floor level within the enclosed *exit stairway*.

"907.2.13.3 Multi-channel voice evacuation" is added to read as follows:

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

"907.2.13.4 Reliability" is added to read as follows:

907.2.13.4 Reliability. If a networked fire alarm system is installed, and if the fire alarm network nodes are interconnected utilizing physical conductors (e.g., metallic, optical fiber), the network

nodes shall be interfaced with each other utilizing Class A wiring methods. The outgoing and return conductors shall not be run in the same cable assembly, enclosure, or raceway.

"907.2.24 Child-care smoke detectors" is added to read as follows:

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

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

"907.3.1 Duct smoke detectors" is amended to read as follows:

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

"907.4.1 Protection of fire alarm control unit" is amended to read as follows:

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

Exceptions:

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

"907.4.2 Manual fire alarm boxes" is amended to read as follows:

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

"907.5.2.1.1 Average sound pressure" is amended to read as follows:

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

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

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

Exception: In areas required to be protected with low-frequency alarms, the 80dBA minimum sound pressure provision is not required where no listed fire alarm device is available to simultaneously achieve both the low-frequency signal and the 80dBA minimum sound pressure.

"907.5.2.1.1.1" is added to read as follows:

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

"907.5.2.1.2 Maximum sound pressure" is amended to read as follows:

907.5.2.1.2 Maximum sound pressure. The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72.

"907.5.2.3 Visible alarms" is amended to read as follows:

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

Exceptions:

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

"907.5.2.3.1 Public and common areas" is amended to read as follows:

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

Exceptions:

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

"907.6.3.1 Alarm Annunciator and Fire Alarm Control Unit" is amended to read as follows:

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

1. If a building has a main entrance/foyer and has more than one story, a read-only remote annunciator shall be provided inside the building at the main entrance/foyer.

   Exceptions:

   1. High-rise buildings provided with a fire command center.
   2. Alternate location as approved by the fire code official.

2. If a building has a fire riser room with an exterior door, the fire alarm control unit shall be provided within the fire riser room.

   Exceptions:

   1. High-rise buildings provided with a fire command center.
   2. Alternate location as approved by the fire code official.

3. The location of an operated initiating device shall be displayed by alphanumeric display at the annunciator.
4. The alphanumeric display shall state the device type, the floor level (if applicable), the device address and a descriptive location for the operated device(s).
5. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

"907.6.5 Monitoring" is amended to read as follows:

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

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

1. Single- and multiple station smoke alarms required by Section 907.2.11.
2. Automatic sprinkler systems in one- and two-family dwellings.
3. Manual fire alarm systems, when provided with approved signs in the following locations: directly below the horn and strobe located on the exterior of the building and adjacent to each manual pull station. The signs shall read as follows: WHEN ALARM SOUNDS - CALL 911. The signs below the horns and strobes shall be of durable material with permanent lettering having a 2" minimum height and minimum ½" stroke on a contrasting background. The sign adjacent to each pull station shall be of durable material with permanent lettering having a ¼" minimum height on a contrasting background.
4. Monitoring systems utilizing point-by-point monitoring.

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

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

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

"907.6.5.3 Supervising Stations" is added to read as follows:

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

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

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

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

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

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

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

"907.6.6 Control units" is added to read as follows:

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

"907.6.7 Connections to other systems" is added to read as follows:

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

"907.6.8 Secondary Response Point" is added to read as follows:

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

907.6.8.1 Where required. When required by the fire code official, an SRP shall be provided in buildings/facilities that are required to be served by a Fire Command Center.

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

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

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

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

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

"907.8 Inspection, testing and maintenance" is amended to read as follows:

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

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

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

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

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

"907.10 Fire Alarm Systems in Existing Buildings" is added to read as follows:

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

907.10.1 Additions. Additions to any building shall comply with this Section and Section 3403 of the International Building Code. In existing buildings where fire alarms are provided for the addition, whether required or not, coverage shall be extended to include the entire building.

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, fire alarm system coverage is not required beyond the fire area containing the addition where the addition fire area is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, with openings protected with automatic-closing devices.
2. In all occupancies, the addition of a *Fire Wall* in accordance with Section 706 of the International Building Code, with openings protected with automatic-closing

devices, may be used to create a new fire area that separates the addition from the remainder of the building. The *Fire Wall* may either:

a. limit required fire alarm system coverage to include only the new fire area containing the addition, or
b. limit required fire alarm system coverage to include the new addition and other existing spaces adjacent to the addition that remain in the same fire area, or
c. eliminate the requirement to install a fire alarm system in accordance with the provisions of Section 907.2.

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

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

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

Exceptions:

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

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

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

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

Exceptions:

1. Other than occupancies of Group E Daycare, Group H, Group I, or Group R, fire alarm system coverage is not required beyond the fire area containing the change of occupancy where the change of occupancy fire area is separated from the reminder of the building by a *fire barrier* of not less than 2-hours, constructed in accordance with Section 707 of the International Building Code, with openings protected with automatic-closing devices.

2. In all occupancies, the addition of a Fire Wall in accordance with Section 706 of the International Building Code, with openings protected with automatic-closing devices, may be used to create a unique fire area to separate the portion of the building containing the change of use from the remainder of the building. The Fire Wall may either:
    a. limit required fire alarm system coverage area to include only the fire area containing the change of use, or
    b. eliminate the requirement to install a fire alarm system in accordance with the provisions of Section 907.2.

"908.8 When an emergency alarm system is interfaced with a building's fire alarm system" is added to read as follows:

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

"909.5.2 Opening protection" is amended to read as follows:

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

Exceptions:

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

"909.16.1 Smoke control systems" is amended to read as follows:

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

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

"909.16.2 Smoke control panel" is amended to read as follows:

909.16.2 Smoke control panel. The firefighter's control panel shall be provided in accordance with Section 909.21.

"909.16.3 Control action and priorities" is amended to read as follows:

909.16.3 Control action and priorities. The firefighter's control panel actions shall be in accordance with Section 909.21.

"909.17 System response time" is amended to read as follows:

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. 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 shall be reported in the required final report.

"909.18.8.3 Reports" is amended to read as follows:

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

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

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

"909.18.10 Alternative testing method" is amended to read as follows:

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

"909.20 Maintenance" is amended to read as follows:

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.

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

Exception: Where periodic inspection and testing is conducted in accordance with requirements set forth by the Building Official of the jurisdiction, compliance with the Southern Nevada Fire Code Committee Uniform Guideline is not required.

"909.20.4 Dedicated smoke control systems" is amended to read as follows:

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.

"909.20.5 Non-dedicated smoke control systems" is amended to read as follows:

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.

"909.21 Smoke Control Panel Design" is added to read as follows:

909.21 Smoke Control Panel Design

909.21.1 Scope. This section applies to Fire Prevention Bureau requirements regarding the design, installation, operation, and approval process for a Firefighter's Smoke Control Panel for Mechanical Smoke Control Systems. Note that smoke control and smoke removal systems can share panel(s).

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

909.21.2.1 Graphic display. The building layout must be graphically represented to clearly indicate location and boundaries of smoke zones with respect to adjacent areas. All walls and doors comprising the egress system for all smoke control zones must be shown on the graphics layout.

The majority of graphics will be shown on a plan view. An exception is allowed for high-rise buildings having common floor plans and one smoke zone per high-rise floor, where a section view of the tower can be allowed in conjunction with plan views of typical tower floors. At a minimum, the panel must satisfy the following requirements:

1. Show a north directional arrow.
2. Show a building layout at an indicated scale on a contrasting background; black and white are acceptable colors for the graphic outlines and for the panel background.
3. The maximum height of any portion of the panel shall be 7'-0" above the finished floor, and the minimum height of any portion of the panel shall be 2'-6" from the floor.
4. Include a panel title block, indicating the facility name and address, and the title "Firefighter Smoke Control Panel."
5. Label each smoke zone area; the label shall include the floor level, i.e., SZ 16-1 shall be the first smoke zone on the 16th floor. Note: when the floor level above grade is different than the floor designation, provide both numbers; ie if the 3rd level above grade is designated as level 15 in the elevators; provide both designations on the panel.
6. Designate between active and passive smoke zones by shading/background.
7. Show all floor and roof levels for all areas.

8. Label the locations of the Fire Command Center, Fire Pump, Emergency Generators, elevators providing access to all floor and roof levels, stairs providing access to all floor and roof levels, and Secondary Response Point.
9. Show the location of all fan units providing smoke control function (both automatic and mop-up fans) and clearly indicate the direction of airflow from each smoke zone to the fan unit protecting that zone. Labels must be provided for each fan and for each opening associated with a fan. Therefore, if there is a fan on the building roof that serves the first level by exhausting air through an opening on the first level, the fan unit, clearly labeled, must be shown on the roof graphic, and the exhaust opening must be shown on the first level, clearly labeled as an exhaust opening associated with the fan.
10. Label fans with a Hand/Auto switch allowing for manual control at the unit.
11. Contain LED's as required. LED annunciation is required for each smoke zone (including passive zones utilizing only dampers), each smoke control fan, each group of smoke control dampers/doors, each stair pressurization fan, each elevator pressurization fan, each mop-up system, for "Abnormal Switch Position", and for power. For smoke fans and pressurization fans, the associated LED shall be close to the graphical representation of the fan.
12. Contain switches for manual control/override of each smoke zone (including passive zones utilizing only dampers), each stair pressurization system, each elevator pressurization system, each mop-up system, and each elevator hoist way vent damper.
13. Contain a button for lamp test.
14. Provide a legend for all symbols, including fans, supply/exhaust openings, etc, and for the LED's provided on the panel.

909.21.2.2 Control switches and buttons Manual control switches must be provided at the panel. The switches shall allow for manual activation of smoke control sequences and override of active smoke control sequences. Control switches shall be provided for each individual active and passive smoke zone, for each stair and elevator pressurization system, for mop-up systems, and for elevator hoist way vent.

Control switches shall be adjacent to LED's associated with each switch. Switches shall be three-position, even for dual-mode smoke zones. Each physical position of the control switch shall be labeled, utilizing "smoke mode– auto – off" labels for smoke zones, "press – auto -off" labels for pressurization systems, "manual purge – auto – off" labels for mop-up systems, and "open - auto - close" labels for elevator hoist way vents.

Control switches shall be provided for:

1. Each smoke zone: the switch for the smoke zone is required to have "smoke mode – auto – off" positions labeled. In "smoke mode" the switch is required to activate all smoke control components, including fans, dampers, and doors, that are required to automatically activate to provide the smoke control function, as dictated on the smoke control diagrams. In the "off" position, the switch is required to move all fans and dampers to a "passive" mode by shutting down all fans and closing all dampers serving that zone. This switch in the "off" position shall not inhibit any stair pressurization or elevator pressurization systems from activating again under a separate scenario. In the "auto" position, the FACP function is allowed to dictate the status of the smoke control system.
2. Each pressurization system: a switch is required to provide manual control of the fan(s) providing air supply to pressurize an enclosure, such as an egress stair and an elevator machine room. The switch for each pressurization system is required to have "press – auto – off" positions labeled. In "press", the switch will activate all pressurization fans required for the pressurized enclosure. This switch in "press" will override automatic controls,

including duct detector shut down of the fan. In the "off" position, the fan must be released from all initiation commands from the FACP; no other activation of a smoke control system by the FACP will override the "off" position and turn the fan back on. In the "auto" position, the FACP function will dictate the fan function.

3. Each mop-up system: the switch for each mop-up system that is only manually activated for mop-up purpose is required to have "manual purge – auto –off " positions labeled. In "manual purge" the switch will activate fans and dampers that are required to configure to achieve the exhaust mode. In the "auto" position, the normal building function will dictate the functioning of all fans and dampers. In the "off" position the switch is required to move all fans and dampers to a "passive" mode by shutting down all fans and closing all dampers serving that zone.
4. Each elevator hoist way vent: the switch for each elevator hoist way vent is required to have "open – auto – close" positions labeled. In "open" the switch will open the elevator hoist way vent dampers. In the "auto" position, the FACP will dictate the status of the vent dampers, with respect to the lobby smoke detectors associated with the hoist way. In the close position the switch is required to move the damper to a "passive" mode by closing the damper.

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

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

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

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

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

909.21.3.3 LED legend: A legend of LED's shall be provided. The legend LED shall continuously be lit. The legend shall indicate the following colors and labels:

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

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

The various LED's shall operate as follows:

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

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

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

909.21.4.2 Operation and timing. Upon automatic activation of a device programmed to initiate a smoke control system, the smoke control system shall automatically configure all smoke control components in a manner to avoid damage to components. All components shall be configured to smoke control status and annunciation of status shall be indicated on the Firefighter Smoke Control Panel within 90 seconds of the initiating alarm being received at the FACP.

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

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

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

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

909.21.5 Approval requirements

909.21.5.1 Submittals. The Fire Prevention Bureau requires a minimum of two copies of plans for all proposed smoke control graphic panels, two copies of narrative describing the sequence and operation for all LED's and switches, and a copy of the approved smoke control diagrams for review.

909.21.5.2 Plans. Plans shall be drawn to an indicated scale. Panel drawings must indicate location of switches and LED's against the panel outline.

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

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

909.21.5.4 Testing. Testing of the smoke control panel operation must be included in the third-party testing of the smoke control system. Final acceptance by the Fire Prevention Bureau includes approval of the third-party test report and testing of the LED's and control switches at the final All-Systems test.

"910.3.1 Design" is added to read as follows:

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

"910.3.2 Vent operation" is added to read as follows:

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

"910.3.2.1 Gravity-operated drop-out vents" is added to read as follows:

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

"910.3.2.2 Sprinklered buildings" is added to read as follows:

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

"910.3.2.3 Nonsprinklered buildings" is added to read as follows:

910.3.2.3 Nonsprinklered buildings. Where installed in buildings not provided with an approved automatic sprinkler system, smoke and heat vents shall operate automatically by

actuation of a heat-responsive device rated at between 100°F (38°C) and 220°F (104°C) above ambient.

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

"910.3.3 Vent dimensions" is added to read as follows:

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

"910.3.5 Draft curtains" is amended to read as follows:

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

"912.2.2.3 Installation on Buildings" is added to read as follows:

912.2.2.3 Installation on Buildings. Fire department connections shall be located on the buildings that they serve.

Exception: As otherwise approved by the fire code official.

"912.3.2 Clear space around connections" is amended to read as follows:

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

"913.1.1 Redundant pumps in high-rise structures" is added to read as follows:

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

"913.1.2 Redundant pumps in multiple structures" is added to read as follows:

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

"913.2.1 Protection of pump rooms" is amended to read as follows:

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

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

"913.2.1.1 Access" is added to read as follows:

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

"913.2.2 Drains" is added to read as follows:

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

"914.3.1 Automatic sprinkler system" is amended to read as follows:

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2.

Exception: An *automatic sprinkler system* shall not be required in *open parking garages* in accordance with Section 406.5 of the International Building Code.

"914.4.1 Automatic sprinkler system" is amended to read as follows:

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

"914.6.1 Automatic sprinkler system" is amended to read as follows:

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

Exceptions:

1. In buildings where an *automatic sprinkler system* is not otherwise required by other sections of this code, sprinklers are not required for *stages* 1,000 square feet (93 m2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
2. Sprinklers are not required within portable orchestra enclosures on *stages.*

"914.8.2 Fire suppression" is amended, to delete the exception, to read as follows:

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

"SECTION 915 SMOKE REMOVAL" is added to read as follows:

SECTION 915
SMOKE REMOVAL

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

915.2 Where Required.

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

915.3 Smoke Removal Panel Design.

915.3.1 Scope. This section applies to Fire Prevention Bureau requirements regarding the design, installation, operation, and approval for a Firefighter Smoke Removal Panel. Note that smoke control and smoke removal systems can share panel(s).

Exception. Upon approval of the *fire code official*, the control panel for the smoke removal system shall be permitted to operate through the building HVAC management system or the fire alarm system.

915.3.2 Required items. The Firefighter Smoke Removal Panel shall be located within the Fire Command Center and shall provide graphics depicting the protected facility and smoke removal fan locations. The panel shall provide control switches that allow smoke removal fans to activate. Light emitting diodes (LED) shall be provided on the panel for the purpose of

annunciation of smoke removal fans. The control panel for the smoke removal system shall not be required to be listed as smoke control equipment.

915.3.2.1 Graphic display. The building layout must be graphically represented to clearly indicate location and boundaries of smoke removal zones with respect to adjacent areas. All walls and doors comprising the egress system for all smoke removal zones must be shown on the graphics layout.

The majority of graphics will be shown on a plan view. An exception is allowed for high-rise buildings having common floor plans and one smoke removal zone per high-rise floor, where a section view of the tower can be allowed in conjunction with plan views of typical tower floors. At a minimum, the panel must satisfy the following requirements:

1. Show a north directional arrow.
2. Show a building layout at an indicated scale on a contrasting background: black and white are acceptable colors for the graphic outlines and for the panel background.
3. The maximum height of any portion of the panel shall be 7'-0" above the finished floor, and the minimum height of any portion of the panel shall be 2'-6" from the floor.
4. Include a panel title block, indicating the facility name and address, and the title "Firefighter Smoke Removal Panel".
5. Label each smoke removal area; the label shall include the floor level, i.e., SRZ 16-1 shall be the first smoke removal zone on the 16th floor. Note: when the floor level above grade is different than the floor designation, provide both numbers; i.e. if the 3rd level above grade is designated as level 15 in the elevators; provide both designations on the panel.
6. Designate between smoke removal zones and areas that do not have smoke removal capabilities.
7. Show all floor and roof levels for all areas.
8. Label the locations of the Fire Command Center, fire pump, emergency generators, elevators providing access to all floor and roof levels, stairs providing access to all floor and roof levels, and the Secondary Response Point location.
9. Show the location of all fan units providing smoke removal functions. Labels must be provided for each fan and for each opening associated with a fan. Therefore, if there is a fan on the building roof that serves the first level by exhausting air through an opening on the first level, the fan unit, clearly labeled, must be shown on the roof graphic, and the exhaust opening must be shown on the first level, clearly labeled as an exhaust opening associated with the fan.
10. Label the fans with a Hand/Auto switch allowing manual control at the unit.
11. Contain LED's as required. LED annunciation is required for each smoke removal fan for each smoke removal zone, for "Abnormal Switch Position", and for power. For smoke removal fans, the associated LED shall be close to the graphical representation of the fan.
12. Contain switches for manual control/override of each smoke removal zone (including passive zones utilizing only dampers).
13. Contain a button for lamp test.
14. Provide a legend for all symbols, including fans, supply/exhaust openings, etc., and for LED's provided on the panel.

915.3.2.2 Control switches and buttons. Manual control switches must be provided at the panel. Control switches shall be provided for each individual smoke removal zone and for each elevator hoist way vent. Control switches shall be adjacent to the LED associated with each switch. Switches shall be three-position and shall be labeled as "manual purge – auto – off" for smoke removal systems.

Switches found on the Firefighter Smoke Removal Panel shall be located reasonably close to the graphical depiction of the associated area/component.

Each smoke removal system: the switch for each smoke removal system that is only manually activated for mop-up purposes is required to have “manual purge – auto – off” positions labeled. In “manual purge” the switch will activate fans and dampers that are required to achieve the exhaust mode. In the “auto” position, the normal building function will dictate the functioning of all fans and dampers. In the “off” position the switch is required to move all fans and dampers to a “passive” mode by shutting down all fans and closing all dampers serving that zone.

915.3.2.3 Annunciation. Status of smoke removal system fans are required to be indicated on the Firefighter’s Smoke Removal Panel. Status shall be indicated using LED’s. Acceptable colors are red, yellow, and green. Red-yellow-green LED sets shall be provided for each smoke removal zone.

915.3.3 General LED status. There are general panel status situations that are required to be indicated by LED’s. These include whether there is power to the panel, and whether any switch on the panel has been moved from “auto” to another position.

915.3.3.1 General, yellow. There shall be a yellow indicator light that will illuminate when any switch on the Firefighter Smoke Removal Panel has been turned from “auto” or set to any position that will override automatic function of the normal building functions.

915.3.3.2 General, green. There shall be a green indicator light that will illuminate to indicate that the firefighter’s smoke removal panel is powered. The label adjacent to this green LED shall state “Power On.”

915.3.3.3 LED legend. A legend of LED’s shall be provided. The legend LED shall continuously be lit. The legend shall indicate the following colors and labels:

1. Red LED: Smoke Removal Mode
2. Yellow LED: Trouble
3. Green LED: Normal

915.3.4 Smoke removal components. LED’s are required to indicate status of the smoke removal system fans. The various LED’s shall operate as follows:

1. Red Only: Shall be illuminated when the associated manual switch has activated the smoke removal zone fans and the fans have been confirmed to be in the proper configuration.
2. Green Only: Shall be illuminated to indicate normal mode when there is no initiation by a manual switch for a smoke removal zone to indicate that the fans are ready for operation.
3. Yellow Only: There shall be no situation where only a yellow LED is illuminated. The yellow LED shall only illuminate in conjunction with a red LED or green LED.
4. Red and Yellow: A combination of the red and yellow LED’s shall illuminate to indicate that the smoke removal zone is being initiated by the manual switch, and positive status indicating proper configuration of smoke removal fans has not been received.
5. Green and Yellow: A combination of green and yellow LED’s shall illuminate when a smoke removal zone is not initiated and the smoke removal fans do not report normal operating status. For instance, this may occur when there is a loss of power required for a smoke removal fan.

915.3.5 Multiple configurations. In no case is the smoke removal system required to configure for more than two adjacent smoke removal zones at a time.

915.3.6 Operation and timing. All components shall be configured to smoke removal status and annunciation of status of smoke removal fans shall be indicated on the Firefighter Smoke Removal Panel within 90 seconds of the initiation of the smoke removal switch.

915.3.7 Approval requirements.

915.3.7.1 Submittals. The Fire Prevention Bureau requires a minimum of two copies of plans for all proposed smoke removal panels, two copies of a narrative describing the sequence of operations for all LED's and switches, and a copy of the approved smoke removal system control diagrams for review.

915.3.7.2 Plans. Plans shall be drawn to an indicated scale. Panel drawings must indicate the locations of the switches and the LED's against the panel outline.

915.3.7.3 Narrative. The narrative shall indicate compliance with this code section, and shall describe all operations of the panel. The narrative shall be formatted as an instruction sheet. Copies of the approved narrative shall be laminated and attached to the Firefighter Smoke Removal Panel for use by the Fire Department for smoke removal functions. The narrative must describe:

1. General operation of the smoke removal systems and related switches.
2. LED indications for the various situations.

915.3.8 Testing. The testing of the Firefighter Smoke Removal Panel operation must be included in the third-party testing of the smoke removal system. Final acceptance by the Fire Prevention Bureau includes approval of the third-party test report and testing of the LED and control switches at the final All-Systems test.

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

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

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

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

> **Exception:** Where periodic inspection and testing is conducted in accordance with requirements set forth by the Building Official of the jurisdiction, compliance with the Southern Nevada Fire Code Committee Uniform Guideline is not required.

"SECTION 916 FIRE RISER ROOMS" is added to read as follows:

SECTION 916
FIRE RISER ROOMS

916.1 Where required. A dedicated fire riser room shall be required for each fire sprinkler system riser.

Exceptions:

1. Where approved by the *Fire code official*, where systems are controlled by wall-mounted Post Indicator Valves (PIV), and where exterior access is provided to the monitoring panel that is located in a conditioned room, a fire riser room is not required.

2. When approved, where a single system serves the building and the system is controlled by a PIV, a riser room is not required.
3. In multi-story facilities, floor control risers are permitted to be located on each floor level in an exit stair enclosure.
4. Systems designed in accordance with NFPA 13D do not require fire riser rooms.
5. Systems designed in accordance with NFPA 13R shall have a riser room/closet that is large enough to facilitate access to all the necessary fire sprinkler and fire alarm valves and devices. This area shall be accessible from the outside with either a door or an access panel large enough to allow for testing and maintenance of system. The area shall also maintain a minimum temperature of 40° F and a maximum temperature of 100° F.

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

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

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

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

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

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

Exceptions:

1. Where the riser room does not contain a Fire Alarm Control Unit or spare sprinklers heads, the riser room shall not be required to be conditioned for maximum temperature.
2. Heating and/or conditioning is not required if calculations are prepared and sealed by a mechanical engineer, on a case-by case address specific basis, proving that the temperature within the riser room does not fall or rise below the temperature range of 40º F to 100º F. To maintain 40º F, the temperature analysis must use a starting temperature of 50º F and use an outside temperature of 0º F for a period of 8 hours. To maintain 100º F, the temperature analysis must use a starting temperature of 90º F and use an outside temperature of 120º F for a period of 8 hours.

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

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

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

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

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

IFC CHAPTER 10

"1006.3 Emergency power for illumination" is amended to read as follows:

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

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

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

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

"1008.1.5 Floor elevation" is amended to read as follows:

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

Exceptions:

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

"1008.1.8 Door arrangement" is amended to read as follows:

1008.1.8 Door arrangement. Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

Exceptions:

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

"1008.1.9.11 Stairway doors" is amended to read as follows:

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

Exceptions:

1. *Unchanged*
2. *Unchanged*
3. In stairways serving buildings other than high-rise buildings, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side. Except for exit discharge doors, the stairway doors shall be automatically unlocked simultaneously without unlatching upon any of the following: a signal from the fire command center, if present, or a signal by emergency personnel from an approved location inside the building; activation of a fire alarm system or a fire sprinkler system in an area served by the stairway; or failure of the power supply.
4. *Unchanged*
5. *Unchanged*
6. Upon approval of the building official, stairway doors opening directly into sleeping units, dwelling units or tenant spaces are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side. The doors are permitted to unlock without unlatching only upon signal from the fire command center, if present, or a signal by emergency personnel from an approved location inside the building.

"1011.2 Floor-level exit signs in Group R-1" is amended to read as follows:

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

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

"Table 1014.3" is amended to read as follows:

TABLE 1014.3
COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)		WITH SPRINKLER SYSTEM (feet)
	Occupancy Load		
	≤ 30	>30	
B, S [d]	100	75	100 [a]
U	100	75	75 [a]
F	75	75	100 [a]
H-1, H-2, H-3	Not Permitted	Not Permitted	25 [a]
R-1	75	75	125 [b]
R-2	75	75	125 [b]
R-3 [e]	75	75	125 [b]
I-3	100	100	100 [a]
All others [c,f]	75	75	75 [a]

"1015.1 Exits or exit access doorways from spaces" is amended to read as follows:

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

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

   Exceptions:

   1. In Group R-1, R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual *sleeping units* or *dwelling units* with a maximum occupant load of 20 where the *sleeping unit* or *dwelling unit* is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 407.4.3.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, or 1015.6.

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

"1015.2.2 Three or more exits or exit access doorways" is amended to read as follows:

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

"1022.4 Openings and penetrations" is amended to read as follows:

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

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

Elevators shall not open into *interior exit stairways* and *ramps*.

Exceptions:

1. In buildings required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* serving a *story* with a floor surface located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge, and accessed by way of a vestibule in accordance with Section 909.20.4 of the International Building Code for the stairway and vestibule pressurization alternative are permitted to provide a second vestibule providing access into the required vestibule for areas considered normally non-occupied spaces. The second vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection connected to the building fire alarm system shall be provided within the second vestibule.
2. In buildings required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* serving a *story* with a floor surface located more than 55 feet (16 764 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge, and designed in accordance with Section 909.20.5 of the International Building Code (stair pressurization alternative) are permitted to provide a vestibule providing access into the interior exit stairway for areas considered normally non-occupied spaces. The vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection connected to the building fire alarm system shall be provided within the vestibule.
3. In buildings not required to comply with Sections 403 or 405 of the International Building Code, each of the *interior exit stairways* are permitted to provide a vestibule between the floor and the *interior exit stairway* for areas considered normally non-occupied spaces. The vestibule is required to be constructed in accordance with Section 909.20 of the International Building Code and provided with automatic-closing opening protection in accordance with Section 716 of the International Building Code. Smoke detection shall be provided within the vestibule. Where a building fire alarm system is provided, the vestibule smoke detector(s) shall be connected to the building fire alarm system.

"1028.6.2.3 Automatic sprinklers" is amended to read as follows:

1028.6.2.3 Automatic sprinklers. Enclosed areas with walls and ceilings in buildings or structures containing s*moke-protected assembly seating* shall be protected with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

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

"1028.15 Carnival and fairs" is added to read as follows:

1028.15 Carnivals and fairs. The grounds of carnivals and fairs, including concession booths, shall be in accordance with Section 1028.15.

1028.15.1 Fire access. Fire apparatus access roads shall be provided in accordance with Section 503.

1028.15.2 Fire extinguishers. The maximum travel distance to a portable fire extinguisher from any part of the grounds shall not exceed 75 feet (22 860 mm).

1028.15.3 Concession stands. Concession stands utilized for cooking shall have a minimum of 10 feet (3048 mm) of clearance on two sides and shall not be located within 10 feet (3048 mm) of amusement rides or devices.

1028.15.3.1 Fire extinguishers at concession stands. Fire extinguishers shall be provided where cooking appliances are used in accordance with Section 904.11.5 and Section 906.

1028.15.4 Internal combustion power sources. Internal combustion power sources, including motor vehicles, generators and similar equipment, shall be in accordance with Section 1028.15.4.

1028.15.4.1 Fueling. Fuel tanks shall be of adequate capacity to permit uninterrupted operation during normal operating hours. Refueling shall be conducted only when the ride is not in use.

1028.15.4.2 Protection. Internal combustion power sources shall be isolated from contact with the public by either physical guards, fencing or an enclosure.

1028.15.4.3 Fire extinguishers. A minimum of one fire extinguisher with a rating of not less than 2-A:10B:C shall be provided.

IFC CHAPTER 11

"1101.1 Scope" is amended to read as follows:

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to adoption of this code.

Exception: Retroactive provisions contained within this code that are more stringent than retroactive provisions adopted by the State Fire Marshal shall not be enforceable until approval for such enforcement is obtained from the State Board of Examiners in accordance with NRS 477.110.

"1101.4.2 Completion of work" is amended to read as follows:

1101.4.2 Completion of work. Work necessary to comply with this chapter shall be completed within a time schedule approved by the fire code official. Where a retrofit installation is required by this code, timelines for installation and completion shall be negotiated between the building owner and the fire code official.

"1101.5 New work in existing buildings" is added to read as follows:

1101.5 New work in existing buildings. Where new work occurs in an existing building or facility, such work shall be in accordance with current code, and fire protection systems impacted in the work area shall be upgraded to current code requirements commensurate with the overall scope of new work.

Exception: Replacement of finishes, furnishings, plumbing fixtures, electrical fixtures, and equipment, which does not increase the fire hazard, shall not require upgrade of fire protection systems.

"1103.2 Emergency responder radio coverage in existing buildings" is amended to read as follows:

1103.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have *approved* radio coverage, as determined by the Fire Chief, in accordance with Section 510.4.1 shall be equipped with such coverage in accordance with Section 510 within a time frame established by the *fire code official.*

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

Exceptions:

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

IFC CHAPTER 20

"2007.1 General" is amended to read as follows:

2007.1 General. All helistops and heliports shall be designed and constructed in accordance with this code, NFPA 418, and FAA AC No:150/5390-2C. Helistops and heliports shall be maintained in accordance with Sections 2007.2 through 2007.8. Helistops and heliports on buildings shall be constructed in accordance with the *International Building Code*.

IFC CHAPTER 24

"2404.2 Location of spray-finishing operations" is amended to read as follows:

2404.2 Location of spray-finishing operations. Spray finishing operations conducted in building areas used for Group A, E, I or R occupancies shall be located in a spray room protected with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 and separated vertically and horizontally from 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.

IFC CHAPTER 30

"3006.1 Required protection" is amended to read as follows:

3006.1 Required protection. Class A and B ovens which contain, or are utilized for the processing of, combustible materials shall be protected by an approved automatic fire-extinguishing system complying with Chapter 9.

Exception: Protection is not required for furnaces and ovens where the operation can not create an area in which the concentration of flammable constituents (vapor, gas, fume, mist or dust) in air exceeds 25 percent of their lower flammable limit (LFL).

"3006.2 Fixed fire-extinguishing systems" is amended to read as follows:

3006.2 Fixed fire-extinguishing systems. Fixed fire-extinguishing systems shall be provided for Class C or D ovens to protect against such hazards as overheating, spillage of molten salts or metals, quench tanks, ignition of hydraulic oil and escape of fuel. It shall be the user's responsibility to consult with the fire code official concerning the necessary requirements for such protection.

Exception: Protection is not required for furnaces and ovens where the operation can not create an area in which the concentration of flammable constituents (vapor, gas, fume, mist or dust) in air exceeds 25 percent of their lower flammable limit (LFL).

IFC CHAPTER 32

"3201.3 Construction documents" is amended to read as follows:

3201.3 Construction documents. At the time of building permit application for new structures designed to accommodate high-piled storage or for requesting a change of occupancy/use, and at the time of application for a storage permit, plans and specifications shall be submitted for review and approval. In addition to the information required by the International Building Code, the storage permit submittal shall include the information specified in this section. Following approval of the plans, a copy of the approved plans shall be maintained on the premises in an approved location. The plans shall include the following:

1. 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*.

"3208.2.2 Racks with solid shelving" is amended to read as follows:

3208.2.2 Racks with solid shelving. Racks with solid shelving having an area greater than 20 square feet (1.86 m^2), measured between approved flue spaces at all four edges of the shelf, shall be in accordance with this section.

Exceptions:

1. Racks with mesh, grated, slatted, or similar shelves having uniform openings not more than 6 inches (152 mm) apart, comprised of at least 50 percent of the overall shelf area, and with approved flue spaces are allowed to be treated as racks without solid shelves.
2. Racks used for the storage of combustible paper records, with solid shelving, shall be in accordance with NFPA 13.

IFC CHAPTER 33

"3310.2 Key Boxes" is deleted in its entirety

"3310.3 Site identification sign" is added to read as follows:

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.

"SECTION 3312 WATER SUPPLY FOR FIRE PROTECTION" is amended to read as follows:

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.

"SECTION 3318 ASBESTOS REMOVAL" is added to read as follows:

SECTION 3318
ASBESTOS REMOVAL

3318.1 General. Operations involving removal of asbestos or asbestos-containing materials from buildings shall comply with Section 3318.

Exception: Section 3318 does not apply to the removal of asbestos from:

1. Pumps, valves, gaskets and similar equipment.
2. Pipes, ducts, girders or beams which have a length less than 21 linear feet (6400 mm).
3. Wall or ceiling panels which have an area less than 10 square feet (0.93 m^2) or a dimension of less than 10 linear feet (3048 mm).
4. Floor tiles when the duration of work can be completed in less than four hours.
5. Group R, Division 3 Occupancies and buildings built in accordance with the International Residential Code.

3318.2 Notification. The fire code official shall be notified 24 hours prior to commencement and closure of asbestos-removal operations. The permit applicant shall notify the building code official when asbestos abatement involves the removal of fire-rated partitions and assemblies. The Department of Air Quality and Environmental Management shall be notifies, and permits shall be obtained in accordance with all adopted rules and regulations.

3318.3 Plastic film. Plastic film which is installed on building elements shall be flame resistant as required for combustible decorative material in accordance with Chapter 8.

3318.4 Signs. Approved signs shall be posted at all entrances, exit and exit-access doors, decontamination areas and waste-disposal areas for asbestos-removal operations. The signs shall state that asbestos is being removed from the area, that asbestos is a suspected carcinogen and that proper respiratory protection is required. Signs shall have a reflective surface and lettering shall be a minimum of 2 inches (51 mm) high.

IFC CHAPTER 50

"5001.4 Retail and wholesale storage and display" is amended to read as follows:

5001.4 Retail and wholesale storage and display. For retail and wholesale storage and display of nonflammable solid and nonflammable or noncombustible liquid hazardous material in Group M occupancies and storage in Group S occupancies, see Sections 5002 and 5003.11.

"5001.2.2.2 Health hazards" is amended to read as follows:

5001.2.2.2 Health hazards. The material categories listed in this section are classified as *health hazards*. A material with a primary classification as a *health hazard* can also pose a *physical hazard*.

1. Highly toxic and toxic materials.
2. Corrosive materials.
3. Radioactive materials

"5001.5.1 Hazardous Material Management Plan" is amended to read as follows:

5001.5.1 Hazardous Materials Management Plan. Where required by the *fire code official* or when the Maximum Allowable Quantity per control area is exceeded, an application for a permit shall include a Hazardous Material Management Plan (HMMP). The HMMP shall include a facility site plan designating the following:

1. Access to each storage and use area.
2. Location of emergency equipment.
3. Location of where liaison will meet emergency responders.
4. Facility evacuation meeting point locations.
5. The general purpose of other areas within the building.
6. Location of all above-ground and underground tanks and their appurtenances including, but not limited to, sumps, vaults, below-grade treatment systems and piping.
7. The hazard classes in each area.
8. Locations of all control areas and Group H occupancies.
9. Emergency exits.

"5001.5.2 Hazardous Material Inventory Statement" is amended to read as follows:

5001.5.2 Hazardous Materials Inventory Statement (HMIS). Where required by the *fire code official*, an application for a permit shall include an HMIS, such as Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Tier II Report or other *approved* statement. The HMIS shall include the following information:

1. Product Name.
2. Component.
3. Chemical Abstract Service (CAS) number.
4. Location where stored or used.
5. Container size.
6. Hazard Classification.
7. Amount in Storage.
8. Amount in use-*closed systems*.
9. Amount in use-*open systems*.
10. Aggregate quantities per control area.
11. Site plan/Floor plan with designated control areas and details of 704 placard for facility and for each control area.
12. Sprinkler design criteria, if sprinklered.
13. Cabinets or exhausted enclosures.
14. NFPA 704 hazard numbers.

"5002.1 Definitions" is amended in part by adding the following:

RADIOACTIVE MATERIALS. Materials which emit alpha or beta particles, gamma rays or neutrons and are regulated by the Nuclear Regulatory Commission or by the Nevada State Health Division Radiation Control.

RETAIL AND WHOLESALE. The sale of new or used goods to: consumers; retailers; industrial, commercial, institutional or professional users; or to other wholesalers.

"5003.2.2.1 Design and construction" is amended to read as follows:

5003.2.2.1 Design and construction. Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.
2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.
3. Readily accessible manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:
   3.1 The point of use.
   3.2 The tank, cylinder or bulk source
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall be clearly visible, accessible and indicated by means of a sign.
5. Backflow prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.
6. Where gases or liquids having a hazard ranking of:
   Health Class 3 or 4
   Flammability Class 4
   Instability Class 3 or 4

   In accordance with the NFPA 704 are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103kPa), an *approved* means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a

hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

Exceptions:

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

7. New and existing remote tank filling connections shall be in accordance with this subsection 7.

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

7.2 The transfer hose connection for liquids that have a pH of 6.0 or less (acidic) shall be equipped with female "Cam-lock" type fittings, sized appropriately.

7.3 The transfer hose connection for liquids that have a pH of 8.0 or greater (basic) shall be equipped with male "Cam-lock" type fittings, sized appropriately.

"5003.5 Hazard identification signs" is amended to read as follows:

5003.5 Hazard identification signs. Unless otherwise exempted by the *fire code official*, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary containers and above-ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the *fire code official*.

5003.5.1 Signage Rating Method. Where more than one chemical is present in a building or specific area, signs shall be provided using one of the following methods:

(1) *Composite Method.* Where many chemicals are present, a single sign shall summarize the maximum ratings contributed by the material(s) in each category and the special hazard category for the building and/or the area.

(2) *Individual Method.* Where only a few chemicals are present or where only a few chemicals are of concern to emergency responders (taking into account factors including physical form, hazard rating, and quantity), individual signs shall be displayed. The chemical name shall be displayed below each sign.

(3) *Composite-Individual Combined Method.* A single sign shall be used to summarize the ratings via the Composite method for buildings or other numerous chemicals. Signs based on the individual Method shall be used for rooms or smaller area within the building containing small numbers of chemicals.

5003.5.2 Markings. Individual containers, cartons, or packages shall be conspicuously marked or labeled in an approved manner. Rooms or cabinets containing compressed gases shall be conspicuously labeled: COMPRESSED GAS.

"5003.8.3.5 Hazardous materials in retail and wholesale Group M display and storage areas and in retail and wholesale Group S storage areas" is amended to read as follows:

5003.8.3.5 Hazardous materials in *retail and wholesale* Group M display and storage areas and in retail and wholesale Group S storage areas. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single *control area* of a *retail and wholesale* Group M display and storage area or a retail and wholesale Group S storage area is allowed to exceed the *maximum allowable quantities per control* area specified in Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building

or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with Section 5003.11.

"5003.8.8 Hazardous Materials Information Storage" is added to read as follows:

5003.8.8 Hazardous Materials Information Storage: When required by the *fire code official* in new or existing buildings or facilities containing hazardous materials in quantities exceeding the maximum allowable quantity per control area, a lockable weatherproof cabinet with appropriate signage shall be installed in an *approved* location. The Hazardous Materials Management Plan shall be contained within the cabinet.

"5003.11 Retail and wholesale Group M storage and display and retail and wholesale Group S Storage" is amended to read as follows:

5003.11 Retail and wholesale Group M storage and display and retail and wholesale Group S storage. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single *control area* of a retail and wholesale Group M display and storage occupancy, or an outdoor *control area*, or stored in a single *control area* of a retail and wholesale Group S storage occupancy, is allowed to exceed the *maximum allowable quantities per control* area indicated in Section 5003.1 when in accordance with Sections 5003.11.1 through 5003.11.3.10.

"5003.11.1" is added to read as follows:

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.

"SECTION 5006 RADIOACTIVE MATERIALS" is added to read as follows:

SECTION 5006
RADIOACTIVE MATERIALS

5006.1 General. Use and handling of permittable quantities of radioactive materials shall be in accordance with this chapter.

5006.2 Permit trigger amounts, To store or handle at any installation any amount of radioactive material for which a specific license from the Nuclear Regulatory Commission and/or Nevada State Health Division Radiation Control is required.

5006.3 Permit submittals. Permit submittals shall include the items listed in Section 5006.3.1 through 5006.3.3.

5006.3.1 Location. A plan view of building showing location(s) of permittable quantities of radioactive materials.

5006.3.2 Quantity and type. Total quantities of radioactive materials, reported in Curies, with the type of emitter (alpha, beta, gamma, neutron) identified.

5006.3.3 Certifications. A copy of the facility's Nuclear Regulatory Commission License and a copy of the facility's Nevada State Health Division Radiation Control License.

IFC CHAPTER 53

"5301.1 Scope" is amended to read as follows:

5301.1 Scope. Storage, use and handling of compressed gases in compressed gas containers, cylinders, tanks and systems shall comply with this chapter, including those gases regulated

elsewhere in this code. Partially full compressed gas containers, cylinders or tanks containing residual gases shall be considered as full for the purposes of the controls required.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Compressed natural gas (CNG) for use as a vehicular fuel shall comply with Chapter 23, NFPA 52 and the *International Fuel Gas Code*.

Cutting and welding gases shall also comply with Chapter 35.

Cryogenic fluids and liquid CO^2 shall comply with Chapter 55. Liquefied natural gas for use as a vehicular fuel shall also comply with NFPA 52 and NFPA 59A.

Compressed gases classified as hazardous materials shall also comply with Chapter 50 for general requirements and chapters addressing specific hazards, including Chapters 58 (Flammable Gases), 60 (Highly Toxic and Toxic Materials), 63 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 64 (Pyrophoric Materials).

LP-gas shall also comply with Chapter 61 and the International Fuel Gas Code.

"5306.5 Medical gas system plan submittal" is added to read as follows:

5306.5 Medical gas system plan submittal. Plans and specifications shall be submitted for review and approval. Following approval of the plans, a copy of the approved plans and permit shall be maintained on the premises in an approved location. As required by the *fire code official*, the plans shall include the following:

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

i. For interior gas supply rooms provide construction fire ratings, ventilation and fire sprinkler information.

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

"5306.6 Medical gas systems, testing" is added to read as follows:

5306.6 Medical gas systems, testing. Hyperbaric systems and medical gas systems required by NFPA 99 to be verified by person other than the installing contractor shall be certified by an independent medical gas testing agency prior to use of the system. The independent medical gas inspector shall hold a current NITC certification and Nevada State Fire Marshal certification as a medical gas inspector. The *fire code official* may witness any or all testing. Copies of the system certification shall be provided to the *fire code official*.

"5307.3 Liquefied carbon dioxide" is added to read as follows:

5307.3 Liquefied carbon dioxide.

1. Construction and operational permits shall be obtained for liquefied carbon dioxide containers or systems.

2. Rooms containing liquefied carbon dioxide tanks, cylinders or containers must be equipped with approved sensors capable of detecting carbon dioxide concentrations of 3% v/v (30,000 parts per million(OSHA STEL).

3. Approved sensors shall be connected to local visible and audible alarms which will alert building occupants at the space containing the liquefied carbon dioxide tank, cylinder, or container when the carbon dioxide level within the room reaches 3% v/v.

4. Rooms required to be equipped with carbon dioxide sensors/alarms, must display signage at the entrance to the room that warns occupants not to enter when alarms are activated.

IFC CHAPTER 56

"5601.1.3 Fireworks" is amended to read as follows:

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

Exceptions:

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

"5601.2.2 Sale and retail display" is amended to read as follows:

5601.2.2 Sale and retail display. Explosives, explosive materials, or fireworks sales shall be conducted according to federal law and only between governmental agencies and/or those licensed and approved to conduct such operations. All retail 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 "Southern Nevada Fire Chiefs Association Approved Guidelines for Fireworks".

"5601.2.4 Financial responsibility" is amended to read as follows:

5601.2.4 Financial Responsibility. Before a permit is issued, as required by Section 5601.2, the applicant shall file with the jurisdiction a valid certificate of insurance complying with Section 105.1.4.1 in the amount of $2,000,000.00 for the purpose of the payment of all damages to persons or property which arise from, or are caused by, the conduct of any act authorized by the permit upon which any judicial judgment results. The *fire code official* is authorized to specify a greater amount when, in his or her opinion, conditions at the location of use indicate a greater amount is required.

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.

"5601.2.4.1 Blasting" is amended to read as follows:

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

"5601.2.4.2 Fireworks display" is amended to read as follows:

5601.2.4.2 Fireworks display. The permit holder shall furnish a certificate of insurance as specified in Chapter 1 for the payment of all potential damages to a person or persons or to property by reason of the permitted display, and arising from any acts of the permit holder, the agent, employees or subcontractors.

"5601.5 Supervision" is amended to read as follows:

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

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

"5603.8 Shot reports" is added to read as follows:

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

1. Date and time of the blast.

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

"5604.1 General" is amended to read as follows:

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*.

"5604.6.5 Signs and placards" is amended to read as follows:

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.

"5604.6.5.2 Placards" is amended to read as follows:

5604.6.5.2 Placards. Type 5 magazines containing Division 1.5 blasting agents shall be prominently placarded during storage as required during transportation by DOTn 49CFR, Part 172 and DOTy 27 CFR, Part 55. All other magazines shall be labeled with the hazard classification only.

"5604.7.1 Security" is amended to read as follows:

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

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

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

2. All outdoor explosives magazines and storage sites shall be equipped with an approved centrally monitored security system.

   Exception: For temporary installations with a duration of less than 30 days, 24 hour manned security guards may be used in lieu of the centrally monitored security system when approved by the *fire code official*.

"5605.1 General" is amended to read as follows:

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

Exceptions:

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

"5607.3 Blasting" is amended to read as follows:

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

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

1. All blasts shall be monitored at the nearest structure by a third party engineering firm. Such monitoring shall be done by a seismologist using a certified, annually calibrated, seismic monitor that shall be capable of measuring blast-induced vibration and blast-induced sound levels.
2. A minimum of two seismographs shall be used to obtain data from each blast as required by the *fire code official.*
3. The maximum ground-borne vibrations shall not exceed a single component peak particle velocity (vector sum) of 0.5 inches per second at the nearest structure.
4. The maximum airblast shall not exceed 120 db at the nearest structure.
5. Monitoring results shall be reported to the *fire code official* within 48 hours in a manner prescribed by the *fire code official*.
6. The blasting contractor shall provide a minimum of 72 hours prior written notice to all residences, property owners, businesses, and public uses within 2500 feet of the blasting area. The manner, form, and content of any such notice shall be subject to the approval of the *fire code official*.
7. For utility notification see 5607.5.
8. The blasting contractor shall notify the Fire Prevention Bureau and fire dispatch a minimum of two (2) hours prior to each blast, and immediately following each blast in a manner prescribed by the *fire code official*.
9. The blasting contractor shall provide for pre-blast, project duration, and post blast inspections of neighboring properties within 300 feet from the nearest blast hole, upon which are located structures in close proximity to the blasting area, or when otherwise required by condition of the *fire code official*. These inspections must be completed by a third party engineering firm.
10. A traffic and access control plan shall be provided when blasting activities are conducted within 100 feet of any public roadway, or when required by the *fire code official.* The plan shall include warning signage, flagging, temporary road closures, and detour routes. This plan may be subject to the approval of the local law enforcement, of traffic enforcement agency.
11. The blasting contractor shall be responsible for removing and cleaning up any blast-related debris from the blast site and adjacent properties.

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

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

"5607.4 Restricted hours" is amended to read as follows:

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

"5607.5 Utility Notification" is amended to read as follows:

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

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

"5607.6 Electric or electronic detonator precautions" is amended to read as follows:

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

"5607.13 Pre-blast procedures" is amended to read as follows:

5607.13 Pre-blast procedures. No blast shall be fired until:

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

"5607.13.1 Warning Signals" is added to read as follows:

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

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

"5607.14 Post-blast procedures" is amended to read as follows:

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

1. No *person* shall return to the blast area until allowed to do so by the blaster in charge.
2. The blaster shall allow sufficient time for smoke and fumes to dissipate and for dust to settle before returning to or approaching the blast area.

3. The blaster shall inspect the entire blast site for misfires before allowing other personnel to return to the blast area.
4. The blaster shall sound an all clear warning signal in accordance with 5607.13.1

"5608.1 General" is amended to read as follows:

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

"5608.2.1 Outdoor fireworks displays" is amended to read as follows:

5608.2.1 Outdoor fireworks displays. In addition to the requirements for firewatch personnel, public safety plan and crowd mangers and other requirements of Section 403, permit applications for outdoor fireworks display using Division 1.3G fireworks shall include a diagram of the location at which the fireworks display will be conducted, including the site from which firework will be discharged; location of buildings, highways, overhead obstructions and utilities; and the lines behind which the audience will be restrained. Displays fired on rooftops shall comply with Chapter 7 of NFPA 1123 and Clark County Fire Prevention Bureau guideline *Fire Safety and Risk Analysis Requirements for Rooftop Fireworks Displays*.

"5608.3.1 Weather conditions" is added to read as follows:

5608.3.1 Weather conditions. Weather conditions including, but not limited to, excessive wind speed shall constitute the basis for canceling the display. The wind measurement locations shall not be shielded by shelters, parapets, roof features, etc.

"5608.3.2 Wind speeds" is added to read as follows:

5608.3.2 Wind speeds. At the discretion of the fire code official, a ground-launched fireworks display may be canceled when wind is blowing in excess of fifteen miles per hour. Rooftop-launched fireworks display may be canceled when the wind exceeds ten miles per hour if, in the opinion of the fire code official, an aerial display might be hazardous to property or endanger any person. Wind speed shall be measured from the fireworks display site.

"5608.4 Clearance" is amended to read as follows:

5608.4 Clearance. Spectators, spectator parking areas and dwellings, buildings, membrane structures, cabanas, tents or structures shall not be located within the display site or fallout area.

Exceptions:

1. This provision shall not apply to pyrotechnic special effects and fireworks displays using Division 1.4.G materials before a *proximate audience* in accordance with NFPA 1126.
2. This provision shall not apply to unoccupied *dwellings,* buildings and structures with approval of the building *owner* and the *fire code official.*

"5608.4.1 Clearance (fallout area)" is added to read as follows:

5608.4.1 Clearance (fallout areas). Fallout areas shall be in accordance with NFPA 1123.

"5608.4.2 Ground pieces" is added to read as follows:

5608.4.2 Ground pieces. Ground pieces shall be located not less than 150 feet from spectators, vehicles, tents, canopies or membrane structures.

"5608.11 Seizure of fireworks" is added to read as follows:

5608.11 Seizure of fireworks. It shall be unlawful to possess, use, explode, offer, display for sale, hold or store any and all fireworks in violation of this section. Upon finding unlawful fireworks, the fire chief, building official, or police chief or their representative shall seize, take, remove or cause to be removed such unlawful fireworks and destroy said unlawful fireworks at the expense of the owner.

"5608.12 Penalty for violation" is added to read as follows:

5608.12 Penalty for violation. Any person operating or maintaining any occupancy, premises or vehicle subject to this regulation who shall permit any hazard to exist on premises under his control or who shall fail to take immediate action to abate a hazard when ordered or notified to do so by the building official or a duly authorized representative shall be guilty of a misdemeanor, and upon conviction thereof, be punished by a fine of not more than one thousand dollars and/or imprisonment in the county jail for not more than six months, or any combination of such fine and imprisonment. Every day of such violation shall constitute a separate offense.

"SECTION 5609 CONSUMER FIREWORKS" is amended to read as follows:

SECTION 5609
CONSUMER FIREWORKS

5609.1 General. Storage, distribution and sales of consumer fireworks shall be in accordance Section 5609 and The Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks.

5609.1.1 Permit required. Permit shall be required in accordance with 105.6 and the Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks.

5609.1.2 Seizure of fireworks. It shall be unlawful to possess, use, explode, offer, display for sale, hold or store any and all fireworks in violation of this section. Upon finding unlawful fireworks, the fire chief, building official, or police chief or their representative shall seize, take, remove or cause to be removed such unlawful fireworks and destroy said unlawful fireworks at the expense of the owner.

5609.1.3 Penalty for violation. Any person operating or maintaining any occupancy, premises or vehicle subject to this regulation who shall permit any hazard to exist on premises under his control or who shall fail to take immediate action to abate a hazard when ordered or notified to do so by the building official or his duly authorized representative shall be guilty of a misdemeanor, and upon conviction thereof, be punished by a fine of not more than one thousand dollars and/or imprisonment in the county jail for not more than six months, or any combination of such fine and imprisonment. Every day of such violation shall constitute a separate offense.

5609.2 Storage. Where the temporary storage of consumer fireworks, 1.4G is allowed by Section 5601.1.3, Exception 4, such storage shall comply with applicable requirements of NFPA 1124.

5609.2.1 Storage for Wholesale Consumer Fireworks. The storage building shall comply with the currently adopted building and fire codes and Chapter 6 of NFPA 1124. It shall be inaccessible to the public. Wholesale storage locations shall be approved by the fire code official.

5609.2.2 Storage for Retail Consumer Fireworks. Retail consumer fireworks shall be stored in an approved wholesale location or sales stand or stand premises when supervised by an adult. Storage locations shall be approved by the fire code official.

5609.2.3 No Smoking signs. No smoking signs shall be posted at all storage locations. No smoking signs with 3-inch tall letters shall be posted on all four sides of the storage container or fireworks stand. Signs shall be bilingual (English/Spanish) and shall be painted or stenciled on the booth.

5609.3 Safe and Sane consumer fireworks. All fireworks items for consumer sale shall be tested per Section 5609.3 within 12 months prior to the date of sale.

5609.3.1 Labels. All fireworks for consumer sales shall bear the California State Fire Marshal's Safe and Sane seal. Each item or case of small items or item box shall bear the seal.

5609.3.2 Packaging. Retailers shall display and sell consumer fireworks in their original packages only.

5609.3.3 Fireworks Construction. The construction and composition of consumer fireworks shall comply with the American Pyrotechnics Association Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties and Theatrical Pyrotechnics, 2001 edition. See Annex C of NFPA 1124.

5609.4 Fire Prevention Bureau Testing and Approval. All consumer fireworks shall be tested and certified by an approved, independent third party testing agency for compliance with the regulation of the Consumer Products Safety Commission (CPSC) as set forth in 16 CFR 1500 and 1505. Wholesalers shall have copies of the test reports shall be available for review.

5609.4.1 Fire Prevention Bureau Testing. Each wholesaler shall provide the Clark County Fire Prevention Bureau with a complete inventory statement for each product or package for sale to consumers at least 90-days in advance of the first day of sale. Testing shall be in accordance with the Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks. Items not listed on the inventory statement will not be permitted for sale.

5609.4.2 Test Method. Each device selected for testing shall be tested according to the Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks. The pass/fail criteria will be according to these documents. Additionally, no product shall exhibit re-ignition, burn-out or prolonged burning within fifteen (15) minutes after the termination of the primary effect produced by the device.

5609.5 Dangerous fireworks. It shall be unlawful for any person to possess, store, to offer for sale, expose for sale, sell at wholesale or retail, or use or explode any dangerous fireworks in the unincorporated towns of Clark County, Nevada. "Dangerous fireworks" include, but are not limited to, the following:

1. Fireworks that contain prohibited chemicals per NFPA 1124;
2. Firecrackers, salutes and other articles which explode;
3. Fireworks that fire an aerial display;
4. Skyrockets and rockets, including all devices which employ any combustible or explosive material and which rise in the air during discharge;
5. Roman candles, including all devices which discharge balls of fire into the air;
6. Sparklers more than ten inches in length or one-fourth inch in diameter;
7 All fireworks designed and intended by the manufacturer to create the element of surprise upon the user. These items include but are not limited to auto foolers, cigarette loads, exploding balls, trick matches;
8. Fireworks known as devil-on-the-walk, or any other fireworks which explode through means of friction;
9. Torpedoes of all kinds which explode on impact;
10 Fireworks kits;

11. Devices that travel a distance exceeding a 10 feet radius.
12. Such other fireworks examined and tested by the chief and determined to possess characteristics of design or construction which make such fireworks unsafe for use by any person not specially qualified or trained in the use of fireworks.

5609.6 Fireworks Stands. Fireworks stands (booths) shall be constructed, arranged and have the following construction and operational features.

5609.6.1 Operations. Fireworks stands shall be operated from June 28 to July 4 of every calendar year.

5609.6.1.1 Fireworks shall be returned to an approved wholesalers storage location at the end of each sales day and there shall be no storage in other locations including, but not limited to, residential neighborhoods, dwellings, garages, public ways, driveways, trailers, or vehicles.

5609.6.2 Certificate of Insurance. The permittee shall furnish a certificate of insurance for hazard coverage of up to $1,000,000 or greater as specified by the Fire Prevention Bureau.

5609.6.3 Personnel. Fireworks stands shall be operated by at least one adult, 18 years or older, and not be occupied by anyone under the age of 14.

5609.6.4 Construction of Stands. Each fireworks stand shall be constructed as follows:

1. No stand (booth) shall exceed 33 feet in length or 10 feet in width.
2. All stands shall have no less than two unobstructed exits measuring a minimum of 6 feet tall and 2 feet in width. The counter shall not be considered an exit.
3. The siding and roof of the booths shall be made of a minimum of ¼-inch plywood or comparable material or of noncombustible materials.
4. All wiring and appliances shall meet the requirements of the National Electrical Code and be protected from damage.
5. Overhead wiring powering fireworks stand shall be a minimum of 13 feet, 6 inches above grade.
6. Trailers used as fireworks stands may be used when approved.

5609.6.5 Fire safety features. Each fireworks stand shall have the following fire safety features;

1. A fully-charged mounted fire extinguisher rated at least 2A 10BC. The fire extinguisher shall be tagged by a contractor licensed by the State Fire Marshal.
2. "No Smoking" signs with 3-inch tall letters posted on all four sides of the stand as required by 5609.2.3.
3. Clear space between the stand and exposures as noted in Table 5609.5.5:

Table 5609.6.5

Minimum Separation Distance from sales stand		
10 feet	**20 feet**	**50 feet**
Combustibles	Buildings	Motor vehicle fuel dispensers
Vehicle Parking	Fireworks storage	Propane dispensers
Curb of edge of roadway, street or driveway	Other fireworks stands	Compressed natural gas dispensing
Water/air dispenser at service stations	Underground storage tank fill port	Aboveground storage tanks for flammable or combustible

		liquids, flammable compressed gases including propane.

5609.7 Ignition of fireworks - Hazardous locations. Ignition of fireworks shall not take place within one hundred feet of a fireworks booth, gasoline service station buildings, gasoline dispensers, flammable or combustible liquid tank fill or vent lines, aboveground flammable or combustible liquid tanks, or any building, structure or vehicle containing unsealed flammable or combustible liquids, hazardous materials or explosives.

5609.7.1 Ignition of Fireworks – General Prohibition. Ignition of fireworks shall take place so as to not endanger persons, buildings, structures, property, brush, automotive vehicles and/or equipment, etc.

5609.7.2 Ignition of Fireworks – Prohibited dates. Ignition of fireworks shall not take place before the 28th day of June or after the 4th day of July of each sales year.

5609.8 Orientation Meetings. The fire code official shall hold at least two (2) orientation meetings. These meetings shall be to review applicable code requirements and The Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks. Each organization running one or more fireworks stands shall attend at least one meeting.

IFC CHAPTER 57

"5704.2.9.2.5 Fire flow" is added to read as follows:

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

"5704.2.13.1.3 Out of service for one year" is amended to read as follows:

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

"5704.2.13.1.4 Tanks abandoned in place" is deleted in its entirety.

"5704.5 Generator and Fire Pump Diesel Fuel Tanks" is added to read as follows:

5704.5 Generator and Fire Pump Diesel Fuel Tanks.

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

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

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

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

"5706.2.4.4 Locations where above-ground tanks are prohibited" is amended to read as follows:

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

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

"5706.5.1.6 Fire protection" is amended to read as follows:

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

"5706.5.4.5 Commercial, industrial, governmental or manufacturing" is amended to read as follows:

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

"5706.5.4.5(1)" is amended to read as follows:

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

IFC CHAPTER 58

"5806.2 Limitations" is amended to read as follows:

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

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

IFC CHAPTER 61

6104.2 Liquefied petroleum gas storage containers" is amended to read as follows:

6104.2 Liquefied petroleum gas storage containers. The storage of liquefied petroleum gas is prohibited.

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

IFC CHAPTER 63

"6304.1.4 Automatic sprinkler system" is amended to read as follows:

6304.1.4 Automatic sprinkler system. The automatic sprinkler system shall be designed in accordance with the 2010 edition of NFPA 400.

IFC CHAPTER 80

"NFPA 13-13" is amended to read as follows:

13- 13 Installation of Sprinkler Systems.....Table 903.1.1, 903.3.2, 903.3.5.1.1, 903.3.5.2, 904.11, 905.3.4, 907.6.3, 1009.3, 3201.1, 3204.2, Table 3206.2, 3206.9, 3207.2, 3207.2.1, 3208.2.2, 3208.2.2.1, 3208.4, 3210.1, 3401.1, 5104.1, 5106.5.7, 5704.3.3.9, Table 5704.3.6.3(7), 5704.3.7.5.1, 5704.3.8.4

"NFPA 13D-13" is amended to read as follows:

13D- 13 Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes 903.3.1.3, 903.3.5.1.1

"NFPA 13R-13" is amended to read as follows:

13R- 13 Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height 903.3.1.2, 903.3.5.1.1, 903.3.5.1.2, 903.4

"NFPA 14-13" is amended to read as follows:

14- 13 Installation of Standpipe and Hose Systems 905.2, 905.3.4, 905.4.2, 905.6.2, 905.8

"NFPA 20-13" is amended to read as follows:

20- 13 Installation of Stationary Pumps for Fire Protection 913.1, 913.2, 913.5.1

"NFPA 22-08" is amended to read as follows:

22-08 Water Tanks for Private Fire Protection.....507.2.2

"NFPA 54-06" is added to read as follows:

54-06 National Fuel Gas Code

"NFPA 72-13" is amended to read as follows:

72- 13 National Fire Alarm Code .....508.1.5, Table 901.6.1, 903.4.1, 904.3.5, 907.2, 907.2.6, 907.2.9.3 907.2.11, 907.2.13.2, 907.3, 907.3.3, 907.3.4, 907.5.2.1.2, 907.5.2.2, 907.6, 907.6.1, 907.6.2, 907.6.5, 907.7, 907.7.1, 907.7.2, 907.8, 907.8.2, 907.8.5, I101.1

"NFPA 140-08" is added to read as follows:

140-08 Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations... 322

"8001 Modified NFPA Standards" is added to read as follows:

8001 Modified NFPA Standards. Standards promulgated by the National Fire Protection Association (NFPA) and modified herein are hereby adopted by reference. NFPA standards are available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101.

"8001.1 NFPA 10, Standard for Portable Extinguishers" is added to read as follows:

8001.1 NFPA 10, Standard for Portable Fire Extinguishers. NFPA 10-2010 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Portable Fire Extinguishers is hereby adopted by reference with the following modifications:

Section 6.1.3.2 of NFPA 10 is amended to read as follows:

6.1.3.2 Fire extinguishers shall be located along normal paths of travel, including exits from areas, unless the *fire code official* determines that the hazard posed indicates the need for placement away from normal paths of travel.

Section 6.1.3.10.1 of NFPA 10 is amended to read as follows:

6.1.3.10.1 Cabinets housing fire extinguishers shall not be locked.

Exceptions:

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

Section 6.2.1.3.1.1 of NFPA 10 is amended to read as follows:

6.2.1.3.1.1 Up to two water-type extinguishers, each with 1-A rating, shall be permitted to be used to fulfill the requirements of one 2-A rated extinguisher for light (low hazard) occupancies only.

Section 6.6.3 of NFPA 10 is amended to read as follows:

6.6.3 All solid fuel cooking appliances (whether or not under a hood) with fire boxes of 5 ft^3 (0.14 m^3) volume or less shall have a minimum 2.5 gallon (9 L) or two 1.5 gallon (6 L) Class K wet-chemical portable fire extinguishers located in accordance with the IFC Section 904.11.5.

Section 6.6.4 of NFPA 10 is amended to read as follows:

6.6.4 When hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows:

(1) For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: One Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity.

(2) For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: One additional Class K portable fire extinguisher of a minimum 1.5 gallon (6 L) capacity shall be provided.

(3) For individual fryers exceeding 6 square feet (0.55 m^2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

"8001.2 NFPA 13, Standard for Installation of Fire Sprinklers" is added to read as follows:

8001.2 NFPA 13, Standard for Installation of Fire Sprinklers. NFPA 13-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Installation of Fire Sprinklers is hereby adopted by reference with the following modifications:

Section 5.3.2.1 of NFPA 13 is amended to read as follows:

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.

Section 6.1.3 of NFPA 13 is amended to read as follows:

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

Section 6.2.9.7.1 of NFPA 13 is amended to read as follows:

6.2.9.7.1 The list shall be on a machine-engraved metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font and include the following:

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

Section 6.3.1.1.2 of NFPA 13 is added to read as follows:

6.3.1.1.2 Pipe or tube shall have a minimum Corrosion Resistant Ratio (CRR) of 1.

Section 6.8.1.4 of NFPA 13 is added to read as follows:

6.8.1.4 The minimum number of required inlets shall be one 2 ½ inch inlet for every 250 gpm of the sprinkler and/or standpipe demand, or fraction there of. Fire Department Connections (FDC) shall be provided with internal check valve(s) such that water being supplied into any inlet will not flow back out of any other inlet. For the purposes of this section, internal clapper valve devices provided by the manufacturer in listed FDC shall be considered internal check valves.

Section 6.9.1 of NFPA 13 is amended to read as follows:

6.9.1 General. Waterflow alarm devices shall be listed for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler of the smallest K-factor installed on the system will result in an audible alarm on the premises no less than 15 seconds and no greater than 60 seconds after such flow begins and until such flow stops.

Section 7.1.3 of NFPA 13 is amended to read as follows:

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

Section 7.2.3.1 of NFPA 13 is amended to read as follows:

7.2.3.1 The system capacity (volume) controlled by a dry pipe valve shall be determined by 7.2.3.2 or 7.2.3.5.

Appendix Section A.7.2.3.1 of NFPA 13 is hereby deleted in its entirety.

Section 7.2.3.3 of NFPA 13 is hereby deleted in its entirety.

Section 7.2.3.4 of NFPA 13 is hereby deleted in its entirety.

Section 7.2.3.5 of NFPA 13 is amended to read as follows:

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.

Section 7.2.6.6.5 of NFPA 13 is added to read as follows:

7.2.6.6.5 A high/low pressure supervisory signal to a constantly attended location shall be installed.

Section 7.3.2.3.1.3 of NFPA 13 is amended to read as follows:

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.

Section 7.6.2.3 of NFPA 13 is added to read as follows:

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

Section 7.10.2.2 of NFPA 13 is hereby deleted in its entirety.

Section 7.10.3.1 of NFPA 13 is amended to read as follows:

7.10.3.1 Unless the requirements of 7.10.3.2 or 7.10.3.4 are met, exhaust ducts shall have one sprinkler or automatic spray nozzle located at the top of each vertical riser, at the midpoint of each offset, and an additional sprinkler shall be installed within the duct at 20-foot intervals on vertical risers where not otherwise provided with sprinklers due to offsets in buildings over two stories.

Section 7.10.9 of NFPA 13 is amended to read as follows:

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

Section 8.2.4 of NFPA 13 is amended to read as follows:

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

Section 8.2.6 of NFPA 13 is added to read as follows:

8.2.6 For spaces of Group A, B, and/or M occupancies adjacent to and having public access exclusively through an adjacent assembly space or mall, such as casinos, covered mall buildings, and other similar uses, the spaces shall be provided with individual isolation control valves. For the purposes of this section, the isolation control valve does not define a separate sprinkler system, such that the overall size of the sprinkler system serving the space(s) and adjacent assembly spaces must meet size limitations of 8.2.1 when measured from the control valve located on the system riser.

Exception: Groups of such spaces having an aggregate area of 5,200 sf or less are be permitted to utilize a single control valve for the sprinklers covering a maximum of 5,200 square feet of area.

Section 8.3.3.1 of NFPA 13 is amended to read as follows:

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

(1) Quick-response type as defined in 3.6.4.7
(2) Residential sprinklers in accordance with the requirements of 8.4.5
(3) Standard response sprinklers used for modifications or additions, within the existing compartment, to existing systems equipped with standard response sprinklers
(4) Standard response sprinklers used where individual standard response sprinklers are replaced in existing systems

Section 8.6.4.1.1.3 of NFPA 13 is amended to read as follows:

8.6.4.1.1.3 The requirements of 8.6.4.1.1.1 shall not apply for light and ordinary hazard occupancies with ceilings of noncombustible construction, as follows:

(**A**) Where there is a vertical change in ceiling elevation within the area of coverage of the sprinkler creates a distance of more than 36 in. (914 mm) between the upper ceiling and the sprinkler deflector, a vertical plane extending down from the ceiling at the change in elevation shall be considered a wall for the purpose of sprinkler spacing as shown in Figure 8.6.4.1.1.3(A).

(**B**) Where the distance between the upper ceiling and the sprinkler deflector is less than or equal to 36 in. (914 mm), the sprinklers shall be permitted to be spaced as though the ceiling was flat, provided the obstruction rules are observed as shown in Figure 8.6.4.1.1.3(B).

Section 8.8.4.1.1.4 of NFPA 13 is amended to read as follows:

8.8.4.1.1.4 The requirements of 8.8.4.1.1.1 shall not apply for light and ordinary hazard occupancies with ceilings of noncombustible construction, as follows.

(**A**) Where there is a vertical change in ceiling elevation within the area of coverage of the sprinkler creates a distance of more than 36 in. (914 mm) between the upper ceiling and the sprinkler deflector, a vertical plane extending down from the ceiling at the change in elevation shall be considered a wall for the purpose of sprinkler spacing.

(**B**) Where the distance between the upper ceiling and the sprinkler deflector is less than or equal to 36 in. (914 mm), the sprinklers shall be permitted to be spaced as though the ceiling was flat, provided the obstruction rules and ceiling pocket rules are observed.

Section 8.14.6 of NFPA 13 is amended to read as follows:

8.14.6 Pilot line detectors shall be permitted to be spaced more than 22 in. (559 mm) below a ceiling or deck where the maximum spacing between pilot line detectors is 10 ft (3 m) or less, and where such spacing is supported by an engineering analysis discussing sprinkler temperature and response rating, plume diameter, temperature within the plume that will pass across the sprinklers, and the expected fire size required to activate the pilot sprinklers.

Section 8.15.2.1 of NFPA 13 is amended to read as follows:

8.15.1.2.1 Concealed spaces of noncombustible construction with minimal combustible loading having no access shall not require sprinkler protection. For purposes of this section, "construction" is limited to wall assemblies, floor assemblies, ceiling assemblies, and structural members.

Section 8.15.1.2.1.2 of NFPA 13 is added to read as follows:

8.15.1.2.1.2 Minor quantities of combustible materials limited to: cabling, nonmetallic piping conveying non-combustible liquids, and nonmetallic HVAC ductwork as expressly allowed by the current adopted building code, shall be permitted in concealed spaces constructed of non-combustible materials and shall not require sprinklers.

Section 8.15.1.2.2 of NFPA 13 is amended to read as follows:

8.15.1.2.2 Concealed spaces of non-combustible construction with limited access and minimal combustible loading and not permitting occupancy or storage of combustibles shall not require sprinkler protection. For the purposes of this section, limited access does not include access to catwalks and mechanical mezzanines. Catwalks and mechanical mezzanines require sprinkler protection, which may be designed in accordance with *Localized Protection of Exposed Combustible Construction or Combustibles,* Section 8.15.1.5. Additionally, "construction" is limited to wall assemblies, floor assemblies, ceiling assemblies, and structural members.

Section 8.15.1.2.10 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.1.2.11 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.1.2.16 of NFPA 13 is amended to read as follows:

8.15.1.2.16 Concealed spaces formed by noncombustible ceilings suspended from the bottom of wood joists, composite wood joists, wood bar joists, or wood trusses that have insulation filling all of the gaps between the bottom of the trusses or joists, and where sprinklers are present in the space above the installation within the trusses or joists, shall not require sprinkler protection.

Section 8.15.1.2.17 of NFPA 13 is amended to read as follows:

8.15.1.2.17 Concealed spaces formed by noncombustible ceilings suspended from the bottom of wood joists and composite wood joists with a maximum nominal chord width of 2 in. (50.8 mm), where joist spaces are full of noncombustible batt insulation with a maximum 2 in. (50.8 mm) air space between the roof decking material and the top of the batt insulation shall not require sprinklers.

Section 8.15.1.2.17.1 of NFPA 13 is amended to read as follows:

8.15.1.2.17.1 Facing that meets the requirements for noncombustible material covering the surface of the bottom chord of each joist and secured in place per the manufacturer's recommendations shall not require sprinklers.

Section 8.15.4.1 of NFPA 13 is amended to read as follows:

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.

Section 8.15.5 of NFPA 13 is amended to read as follows:

8.15.5 Elevator Hoistways and Machine Rooms.

8.15.5.1* Sidewall spray sprinklers shall be installed at the bottom of each elevator hoistway not more than 2 ft (0.61 m) above the floor of the pit.

8.15.5.2 The sprinkler required at the bottom of the elevator hoistway by 8.15.5.1 shall not be required for enclosed, noncombustible elevator shafts that do not contain hydraulic fluids.

8.15.5.3 Automatic fire sprinklers shall not be required in elevator machine rooms, elevator machinery spaces, control spaces, or hoistways of traction elevators installed in accordance with the applicable provisions in NFPA *101*, or the applicable building code, where all of the following conditions are met:

(1) The elevator machine room, machinery space, control room, control space, or hoistway of traction elevator is dedicated to elevator equipment only.
(2) The elevator machine room, machine room, machinery space, control room, or control space, are protected by smoke detectors, or other automatic fire detection, installed in accordance with *NFPA 72*.
(3) The elevator machinery space, control room, control space, or hoistway of traction elevators is separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire resistance rating of not less than that specified by the applicable building code.
(4) No materials unrelated to elevator equipment are permitted to be stored in elevator machine rooms, machinery spaces, control rooms, control spaces, or hoistways of traction elevators.
(5) The elevator machinery is not of the hydraulic type.

8.15.5.4* Automatic sprinklers in elevator machine rooms or at the tops of hoistways shall be of ordinary- or intermediate temperature rating.

8.15.5.5* Upright, pendent, or sidewall spray sprinklers shall be installed at the top of elevator hoistways.

8.15.5.6 The sprinkler required at the top of the elevator hoistway by 8.15.5.5 shall not be required where the hoistway for passenger elevators is noncombustible or limited-combustible and the car enclosure materials meet the requirements of ASME A17.1, *Safety Code for Elevators and Escalators*.

Section 8.15.7.1 of NFPA 13 is amended to read as follows:

8.15.7.1 Unless the requirements of 8.15.7.2 or 8.15.7.4 are met, sprinklers shall be installed under exterior projections exceeding 4 ft (1.2 m) in width.

Section 8.15.7.2 of NFPA 13 is amended to read as follows:

8.15.7.2 Sprinklers shall be permitted to be omitted where the exterior projections are constructed entirely with materials that are noncombustible and where the exterior projections do not support occupancy above.

Section 8.15.7.3 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.8.1.1 of NFPA 13 is amended to read as follows:

8.15.8.1.1 Sprinkler protection shall be provided in all bathrooms.

Section 8.15.8.1.1 of NFPA 13 is amended to read as follows:

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 ft^2 (5.1 m^2). Such rooms shall be surrounded by walls and doors that completely enclose the room.

Section 8.15.8.2 of NFPA 13 is amended to read as follows:

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

Section 8.15.11.1 of NFPA 13 is amended to read as follows:

8.15.11.1 Sprinkler protection shall be required in electrical equipment rooms.

Section 8.15.11.3 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.15.1 of NFPA 13 is amended to read as follows:

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

Section 8.15.15.2 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.15.3 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.15.4 of NFPA 13 is hereby deleted in its entirety.

Section 8.15.20.1.1 of NFPA 13 is added to read as follows:

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.

Section 8.15.20.1.2 of NFPA 13 is added to read as follows:

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

Section 8.15.20.1.3 of NFPA 13 is added to read as follows:

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.

Section 8.15.20.1.4 of NFPA 13 is amended to read as follows:

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

Section 8.15.23.3 of NFPA 13 is amended to read as follows:

8.15.23.3 Where there is a noncombustible space above a noncombustible drop ceiling that is sprinklered because it is open to an adjacent sprinklered space on only one side and where there is no possibility for storage above the drop ceiling, the sprinkler system shall be permitted to extend only as far into the space as 0.6 times the square root of the design area of the sprinkler system in the adjacent space.

Section 8.15.24 of NFPA 13 is added to read as follows:

8.15.24 Openings in Rated Assemblies. Where sprinkler protection is serving as the alternative to opening protection in rated assemblies, such sprinklers shall be listed for use, and installed in accordance with their listing. These sprinklers shall be on a separate sprinkler system, and shall be controlled, monitored, and supplied independently of the overhead system(s).

Section 8.15.25 of NFPA 13 is added to read as follows:

8.15.25 Temporary Exhibit Booths Within a Permanent Building. Where sprinkler protection is required in temporary exhibit booths constructed in a permanent building, such systems shall comply with Section 8.15.25.

8.15.25.1 Hydraulic Design. Systems shall meet Density/Area Method requirements of Section 11.2.3.2 or the Pipe Schedule method of Section 23.5. The minimum design shall be for Ordinary Hazard Group 2, or higher design to accommodate the hazard within the temporary exhibit booth.

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

8.15.25.3 Hangers. Hangers conforming to Section 9.1 shall be provided for temporary piping to temporary exhibit booths. Hangers shall be permitted to be attached to the temporary exhibit booth structure.

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

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

Section 8.16.1.1.1.4 of NFPA 13 is added to read as follows:

8.16.1.1.1.4 Valve rooms shall be lighted and heated.

Section 8.16.1.1.1.5 of NFPA 13 is added to read as follows:

8.16.1.1.1.5 The source of heat shall be of a permanently installed type.

Section 8.16.1.1.1.6 of NFPA 13 is added to read as follows:

8.16.1.1.1.6 Heat tape shall not be used in lieu of heated valve enclosures to protect the valve and supply pipe against freezing.

Section 8.16.1.1.2.1 of NFPA 13 is amended to read as follows:

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 central station, proprietary, or remote station signaling service.

Section 8.16.1.1.2.3 of NFPA 13 is amended to read as follows:

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.

Section 8.16.1.2.5 of NFPA 13 is amended to read as follows:

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.

Section 8.16.1.5 of NFPA 13 is amended to read as follows, with the deletion of 8.16.1.5.3 in its entirety:

8.16.1.5 Floor Control Valve Assemblies.

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

8.16.1.5.2 The floor control valve, check valve, main drain valve, and flow switch required by 8.16.1.5.1 shall not be required where sprinkler systems protecting atriums, covered mall buildings, and other areas with non-standard ceiling heights within the building, are supplied by piping from the protected floor system below.

Section 8.16.4.1.6 of NFPA 13 is amended to read as follows:

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

Section 8.17.1.1 of NFPA 13 is amended to read as follows:

8.17.1.1. Local Waterflow Alarm Units. A local waterflow alarm unit shall be provided on every sprinkler system. Such waterflow alarm units shall be installed in accordance with 6.9.

Section 8.17.2.3 of NFPA 13 is amended to read as follows:

8.17.2.3 Size. The size of the pipe for the fire department connection shall be in accordance with one of the following:

(1) Pipe size shall be a minimum of 4 in. (100 mm) for fire engine connections when the fire department connection has three or fewer 2-1/2 in (65 mm) inlets, and shall be a minimum of 6 in. (150 mm) for fire engine connections when the fire department connection has four or more 2-1/2 in (65 mm) inlets.
(2) Pipe size shall be a minimum of 6 in. (150 mm) for fire boat connections.
(3) For hydraulically calculated systems the fire department connection shall be permitted to be less than 4 in. (100 mm) and no less than the size of system riser, where serving one system riser.

Section 8.17.2.4.1.3 of NFPA 13 is added to read as follows:

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.

Section 9.1.3.9.3 of NFPA 13 is amended to read as follows:

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

Section 9.1.3.9.4 of NFPA 13 is added to read as follows:

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

Section 9.2.1.3.3.5 of NFPA 13 is added to read as follows:

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.

Section 9.3.5.9.3.1 of NFPA 13 is amended to read as follows:

9.3.5.9.3.1 The value of S_s used in Table 9.3.5.9.3 shall be 0.95 or derived from seismic hazard maps.

Section 9.3.6.7 of NFPA 13 is amended to read as follows:

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

Section 10.1.5 of NFPA 13 is amended to read as follows:

10.1.5 Working Pressure. Piping, fittings, and other system components shall be rated for the maximum system working pressure to which they are exposed but shall not be rated at less than 150 psi (10 bar). When the underground piping can be supplied or pressurized by a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 200), or 50 psi greater than the FDC design pressure, whichever is greater.

Section 11.2.3.1.4(4)(a) of NFPA 13 is amended to read as follows:

11.2.3.1.4(4)(a) Noncombustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

Section 11.2.3.1.4(4)(b) of NFPA 13 is amended to read as follows:

11.2.3.1.4(4)(b) Noncombustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

Section 11.2.3.1.4(4)(d) of NFPA 13 is amended to read as follows:

11.2.3.1.4(4)(d) Light or ordinary hazard occupancies where noncombustible ceilings are directly attached to the bottom of solid wood joists or solid noncombustible construction so as to create enclosed joist spaces 160 ft^3 (4.8 m^3) or less in volume, including space below insulation that is laid directly on top or within the ceiling joist in an otherwise sprinklered concealed space.

Section 11.2.3.1.4(4)(e) of NFPA 13 is hereby deleted in its entirety.

Section 11.2.3.1.4(4)(d) of NFPA 13 is hereby deleted in its entirety.

Section 11.2.3.1.4(4)(j) of NFPA 13 is amended to read as follows:

11.2.3.1.4(4)(j) Light or ordinary hazard occupancies where non-combustible ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25.4 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft^3 (4.5 m^3) using materials equivalent to ½ in. (12.7 mm) gypsum board and at least 3 ½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

Section 11.3.1.1 of NFPA 13 is amended to read as follows:

11.3.1.1 The design area shall be in accordance with either 11.2.3.2 or 11.2.3.3.

Section 11.3.1.3 of NFPA 13 is amended to read as follows:

11.3.1.3 Unless the requirements of 11.3.1.4 are met, the minimum required discharge from each sprinkler shall be the greater of the following:

(1) In accordance with the minimum flow rates indicated in the individual listings

(2) Calculated based on delivering a minimum of 0.1 gpm/ft^2 (4.1 mm/min) over the design area in accordance with the provisions of 8.5.2.1 or 8.6.2.1.2.

Section 11.3.3.1 of NFPA 13 is amended to read as follows:

11.3.3.1 Sprinklers in a water curtain such as described in 8.15.4, 8.15.17.2 or 8.15.23 shall be hydraulically designed to provide a discharge of 3 gpm per lineal foot (37L/min per lineal meter) of water curtain, with no sprinklers discharging less than 15 gpm (56.8 L/min) or per the listing requirements of the specific head being used.

Section 11.3.3.3 of NFPA 13 is added to read as follows:

11.3.3.3 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.

Section 11.3.5 of NFPA 13 is added to read as follows:

11.3.5 NONSTORAGE OCCUPANCIES WITH HIGH CEILINGS

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

11.3.5.2 Non-storage occupancies with ceiling heights over 50 feet. All structures, regardless of occupancy or hazard classification, with ceiling heights exceeding 50'-0", require a design analysis from a licensed Fire Protection Engineer. This analysis must be submitted to the

Authority Having Jurisdiction for review and approval prior to the start of construction. Deluge systems shall be installed using sprinklers with a minimum k-factor of 11.2 with a maximum sprinkler discharge pressure of 30 psi.

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

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

Section 11.3.6 of NFPA 13 is added to read as follows:

11.3.6 SPRINKLER PROTECTION FOR EXHIBITION SPACES AND STAGES WITH FLY GALLERIES

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

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

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

Section 12.9.2(1) of NFPA 13 is amended to read as follows:

12.9.2(1) Noncombustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

Section 12.9.2(2) of NFPA 13 is amended to read as follows:

12.9.2(2) Noncombustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.

Section 12.9.2(4) of NFPA 13 is amended to read as follows:

12.9.2(4) Light or ordinary hazard occupancies where noncombustible ceilings are directly attached to the bottom of solid wood joists so as to create enclosed joist spaces 160 ft^3 (4.8 m3) or less in volume, including space below insulation that is laid directly on top or within the ceiling joist in an otherwise sprinklered concealed space.

Section 12.9.2(5) of NFPA 13 is hereby deleted in its entirety.

Section 12.9.2(6) of NFPA 13 is hereby deleted in its entirety.

Section 12.9.2(10) of NFPA 13 is amended to read as follows:

12.9.2(10) Light or ordinary hazard occupancies where non-combustible ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25.4 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft^3 (4.5 m^3) using materials equivalent to ½ in. (12.7 mm) gypsum board and at least 3 ½ in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

Section 22.15.2.2.1.3.1 of NFPA 13 is added to read as follows:

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

Section 22.38 of NFPA 13 is added to read as follows:

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

22.38.1 General. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, for a IBC Group R Division 3 Occupancy and buildings built under the IRC, the design requirements in Table 22.38.1 shall be applied.

Table 22.38.1 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC[4]

Building Area Size Range [6]	Protection Residential System Type[1,3]	Separate Sprinkler Lead-In Required [5]	Minimum Underground Pipe Size [5]	Minimum Water Meter Size[7]	Sprinklers Required In Areas Subject To Freezing.
<3,600 sq ft	Standard NFPA 13D [2]	See NFPA 13D for design requirements.			
>3,600 sq ft & <10,000 sq ft	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements			
>10,000 sq ft & <15,000 sq ft	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
> 15,000 sq ft	Modified NFPA 13 [1]	Yes	N/A	N/A	Yes

N/A = Not Applicable

1. This protection constitutes a building "protected with an approved fire sprinkler system" per the IFC.
2. Domestic demand of 5 gpm is required to be added to the sprinkler demand in the hydraulic calculations.

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

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

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

a. Inaccessible attic spaces.
b. Exterior overhangs, porches, and carports.
c. Rooms not provided with environmental control.

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

Section 23.1.3 of NFPA 13 is amended to read as follows:

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

(1) Name of owner and occupant
(2) Location, including street address
(3) Point of compass
(4) Full height cross section, or schematic diagram, including structural member information is required for clarify and including ceiling construction and method of protection for nonmetallic piping
(5) Ceiling/roof heights and slopes not shown in the full height cross section
(6) Location of partitions
(7) Location of fire walls
(8) Occupancy class, label and name of all areas or rooms
(9) Location and size of concealed spaces, closets, attics, and bathrooms
(10) Any small enclosures in which no sprinklers are to be installed
(11) Size of city main in street and whether dead end or circulating; if dead end, direction and distance to nearest circulating main; and city main test results and system elevation relative to test hydrant
(12) Other sources of water supply, with pressure and elevation
(13) Make, type, model, and nominal K–factor of sprinklers including sprinkler identification number
(14) Temperature rating and location of high-temperature sprinklers
(15) Total area protected by each system on each floor
(16) Number of sprinklers on each riser per floor
(17) Total number of sprinklers on each dry pipe system, preaction system, combined dry pipe-preaction system, or deluge system
(18) Approximate capacity in gallons of each dry pipe system
(19) Pipe type and schedule of wall thickness
(20) Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line
(21) Location and size of riser nipples
(22) Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawing any sections to be shop welded and the type of fittings or formations to be used
(23) Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable
(24) All control valves, check valves, drain pipes, and test connections
(25) Make, type, model, and size of alarm or dry pipe valve
(26) Make, type, model, and size of preaction or deluge valve
(27) Kind and location of alarm bells
(28) Size and location of standpipe risers, hose outlets, hand hose, monitor nozzles, and related equipment

(29) Private fire service main sizes, lengths, locations, weights, materials, point of connection meters, and valve pits; and the depth that the top of the pipe is laid below grade
(30) Piping provisions for flushing
(31) Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
(32) For hydraulically designed systems, the information on the hydraulic data nameplate
(33) A graphic representation of the scale used on all plans
(34) Name, address, phone number, and contractor's license number of sprinkler contractor
(35) Nevada State Fire Marshal registration number
(36) Signature and NICET number, or engineer's seal, of the designer
(37) General notes as required by the AHJ
(38) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets
(39) The minimum rate of water application (density or flow or discharge pressure), the design area of water application, in-rack sprinkler demand, and the water required for hose streams both inside and outside
(40) The total quantity of water and the pressure required noted at a common reference point for each system
(41) Relative elevations of sprinklers, junction points, and supply or reference points
(42) If room design method is used, all unprotected wall openings throughout the floor protected
(43) Calculation of loads for sizing and details of sway bracing
(44) The setting for pressure-reducing valves
(45) Information about backflow preventers (manufacturers, size, type)
(46) Information about antifreeze solution used (type and amount)
(47) Size and location of hydrants, showing size and number of outlets and if outlets are to be equipped with independent gate valves. Whether hose houses and equipment are to be provided, and by whom, shall be indicated. Static and residual hydrants that were used in the flow tests shall be shown
(48) Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system
(49) Size, location, and piping arrangement of fire department connections
(50) Ceiling/roof heights and slopes not shown in the full height cross section
(51) Edition year of NFPA 13 that the sprinkler system is designed to.

Section 23.1.3.1 of NFPA 13 is added to read as follows:

23.1.3.1 General Notes shall be added to the plans to provide clarity of design. The plans shall contain the following general note narratives:

(1) Describe the scope of work that is covered by permit. Indicate where sprinklers are being provided and for what purpose. For permits where the scope of work is only over a portion of a facility, the area of work shall be marked by a boundary line that is labeled "Scope of Work", and the narrative shall address this situation.
(2) Provide a general description of building use and associated occupancy classification per NFPA 13 for all building areas
(3) Indicate whether area is designed for storage. If the sprinkler system is being designed to accommodate storage, indicate the commodity storage height, storage configuration (rack, solid-pile, etc), aisle width between racks as applicable, commodity classification per NFPA 13, and whether commodity is encapsulated.
(4) Indicate the manufacturer, schedule, and type of branch line piping

(5) Indicate the manufacturer, schedule, and type of main piping
(6) Indicate the manufacturer, schedule, and type of fittings and couplings
(7) Indicate the manufacturer, schedule, and type of underground piping
(8) Indicate the manufacturer, model number and type of water meter assembly
(9) Indicate the type of freeze protection provided (i.e. building heated to 40 ºF at all times, dry system, etc.)
(10) Indicate the maximum system pressure for each riser/system, and indicate the minimum pressure required for the hydrostatic test of each riser/system.
(11) Indicate the maximum sprinkler deflector distance below the roof deck
(12) Indicate the type of construction, whether combustible or non-combustible
(13) Indicate whether there are any combustible concealed spaces. Indicate how combustible concealed spaces are protected.
(14) Indicate whether construction is classified as unobstructed or obstructed construction
(15) Indicate the ceiling flatness and material. Indicate whether the ceiling is horizontal and flat, or it has a slope, has soffits, or other variations in ceiling height. For all instances of soffits and other variations of ceiling height, refer to details for each instance shown on the plan. Indicate whether ceiling materials consist of thin combustible membranes, such as stretch plastic or fabric. Any installation under a thin combustible membrane shall be accompanied by an approved engineering analysis.
(16) Indicate whether central station is required.
(17) Indicate the location of the sprinkler head box, and indicate that the room where the box is located is conditioned to 100 degrees F or less.

Section 23.2.1 of NFPA 13 is added to read as follows:

23.2.1 Water Supply Capacity Information. The following information shall be included:

(1) Location and elevation of static and residual test gauge with relation to the riser reference point
(2) Flow location
(3) Static pressure, psi (bar)
(4) Residual pressure, psi (bar)
(5) Flow, gpm (L/min)
(6) Date
(7) Time
(8) Flow tests shall be witnessed by the Authority Having Jurisdiction
(9) Other sources of water supply, with pressure or elevation

Section 23.4.1.6 of NFPA 13 is added to read as follows:

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

Section 23.4.1.7 of NFPA 13 is added to read as follows:

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

Section 24.2.1.14 of NFPA 13 is added to read as follows:

24.2.1.14 When pressure testing in CPVC piping and fittings, the sprinkler system shall be slowly filled with water and the air bled from the highest and farthest sprinkler heads before

pressure testing is applied. Air or compressed gas must never be used for pressure testing of CPVC piping and fittings.

Section 25.2.3.2.2 of NFPA 13 is added to read as follows:

25.2.3.2.2 The test shall measure the time to trip the valve and the time for water to be discharged from the inspector's test connection. The flow from the inspector's test shall be predominantly continuously flowing water with small amounts of air permitted. All times shall be measured from the time the inspector's test connection is completely opened.

Section 25.2.3.2.2.1 of NFPA 13 is amended to read as follows:

25.2.3.2.2.1 Dry systems calculated for water delivery in accordance with 7.2.3.6 shall be required to prove the specific water delivery time requirement set forth in 7.2.3.5 and 7.2.3.7.

Section 25.5.1 of NFPA 13 is amended to read as follows:

25.5.1 The installing contractor shall identify a hydraulically designed sprinkler system with a machine-engraved weatherproof metal or rigid plastic sign with capitalized lettering a minimum 14 point (¼ inch high) in Arial or similar font secured to the riser it serves with corrosion-resistant wire, chain, or other means approved by the AHJ. Such signs shall be placed at the alarm valve, dry pipe valve, preaction valve, or deluge valve supplying the corresponding hydraulically designed area. Signs located at the system control riser shall be allowed to be combined with the General Information Sign described in 25.6.

Section 25.6.1.1 of NFPA 13 is amended to read as follows:

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

Section 25.6.1.2 of NFPA 13 is amended to read as follows:

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.

"8001.3 NFPA 13D, Standard for Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes" is added to read as follows:

8001.3 NFPA 13D, Standard for Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes. NFPA 13D-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes is hereby adopted by reference with the following modifications:

Section 1.1.1 of NFPA 13D is amended to read as follows:

1.1.1 This standard shall cover the design and installation of automatic sprinkler systems for protection against the fire hazards in one- and two-family dwellings and manufactured homes. When sprinkler protection is being provided to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the minimum design criteria shall be as outlined in Section 8.4 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC.

Section 3.3.11.4 of NFPA 13D is amended to read as follows:

3.3.11.4 ***Network Sprinkler System.*** A type of multipurpose system utilizing a common piping system supplying all domestic fixtures and fire sprinklers.

Section 4.2.3 of NFPA 13D is amended to read as follows:

4.2.3 When pressure testing in CPVC piping and fittings, the sprinkler system shall be slowly filled with water and the air bled from the highest and farthest sprinkler heads before pressure testing is applied. Air or compressed gas must never be used for pressure testing of CPVC piping and fittings

Section 4.5 of NFPA 13D is amended to read as follows:

4.5 Working Plans

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

1. Name of owner.
2. Location, including street address.
3. Point of compass.
4. Full height cross section.
5. Ceiling/roof heights and slopes not shown in the full height cross section.
6. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
7. Name and label for each area or room.
8. For systems supplied by city mains, location and size of city main in street, and location, size, and type of domestic line, including length to city connection, and water meter location and size. Static and residual hydrants that were used in flow tests shall be shown. The location of the 5 gpm domestic demand shall be indicated.
9. Make, type, model, temperature rating, nominal K-factor, and number of each type of sprinkler, including sprinkler identification number.
10. Pipe type and schedule of wall thickness.
11. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
12. Location and size of riser nipples and drops.
13. Type of fittings and joints.
14. Type and locations of hangers, and methods of securing sprinklers when applicable.
15. Location and size of all valves and 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.

Section 6.2.3.1 of NFPA 13D is amended to read as follows:

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

Section 6.3.1 of NFPA 13D is amended to read as follows:

6.3.1 A multipurpose piping system shall be installed in accordance with 6.3 through 6.6.

Section 6.3.1.1 of NFPA 13D is added to read as follows:

6.3.1.1 All one and two-family dwellings sprinkler systems supplied by the water purveyor shall be multi-purpose, in accordance with this section. This requirement applies both to systems fed with a single-outlet water meter and to systems fed with a dual-outlet water meter, which may be required by the water purveyor.

Section 6.5 of NFPA 13D is amended to read as follows:

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

Section 6.5.1 of NFPA 13D is amended to read as follows:

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

Section 6.5.3 of NFPA 13D is amended to read as follows:

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.

Section 6.5.4 of NFPA 13D is added to read as follows:

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.

Section 6.5.5 of NFPA 13D is amended to read as follows:

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.

Section 6.5.6 of NFPA 13D is amended to read as follows:

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.

Section 6.5.7 of NFPA 13D is amended to read as follows:

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

Section 6.5.8 of NFPA 13D is amended to read as follows:

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

Section 6.6 of NFPA 13D is added to read as follows:

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

Section 6.6.1 of NFPA 13D is added to read as follows:

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.

Section 6.6.2 of NFPA 13D is added to read as follows:

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.

Section 6.6.3 of NFPA 13D is added to read as follows:

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.

Section 6.6.4 of NFPA 13D is added to read as follows:

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.

Section 6.6.5 of NFPA 13D is added to read as follows:

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.

Section 6.6.6 of NFPA 13D is added to read as follows:

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.

Section 6.6.7 of NFPA 13D is added to read as follows:

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.

Section 6.6.8 of NFPA 13D is added to read as follows:

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.

Section 7.1.1 of NFPA 13D is amended to read as follows:

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

Section 7.1.2 of NFPA 13D is amended to read as follows:

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

Section 7.7 of NFPA 13D is amended to read as follows:

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

Section 8.1.3.1.2 of NFPA 13D is amended to read as follows:

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

Section 8.3.4.1 of NFPA 13D is added to read as follows:

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

Section 8.4 of NFPA 13D is added to read as follows:

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

8.4.1 General. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 8.4 shall be applied.

Table 8.4

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

Building Area SIZE RANGE [6]	Mitigation Residential SYSTEM TYPE[1,3]	SEPARATE SPRINKLER LEAD-IN REQUIRED [5]	MINIMUM UNDERGROUND PIPE SIZE [5]	MINIMUM WATER METER SIZE[7]	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
< 3,600 sq.ft.	Standard NFPA 13D [2]	No	1"	¾"	No
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	No	1"	¾"	No
> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	See NFPA 13R for design requirements			
>15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements			

N/A = Not Applicable

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

8.4.2.1 Where required. When Table 8.4 requires an Enhanced 13D design, sprinklers shall be installed throughout the structure except where omissions are permitted by section 8.3, and the following:

1. Unheated attic spaces.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.
4. Exterior overhangs, porches, and carports

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

Section 10.1.1.1 of NFPA 13D is amended to read as follows:

10.1.1.1 The system shall provide at least the flow required to produce a minimum discharge density of 0.05 gpm/ft^2 (2.04 mm/min) or the sprinkler listing, whichever is greater, to the design sprinklers including fire sprinklers required in garages per section 8.3.4.1.

Section 12.1 NFPA 13D is amended to read as follows:

12.1 The installer shall provide to the owner/occupant instructions on inspecting, testing, and maintaining the system. The instructions shall be attached to the riser or the inside of the panel access door. The instructions shall be weatherproof.

"8001.4 NFPA 13R, Standard for Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height" is added to read as follows:

8001.4 NFPA 13R, Standard for Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height. NFPA 13R-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height is hereby adopted by reference with the following modifications:

Section 1.1 of NFPA 13R is amended to read as follows:

1.1 Scope

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

When sprinkler protection is being provided to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access for single-family residential occupancies, the minimum design criteria shall be as outlined in Section 7.6 Protection Matrix for Group R Division 3 Occupancies and buildings built under the IRC.

Section 5.1.3 of NFPA 13R is amended to read as follows:

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

Section 5.2.1 of NFPA 13R is amended to read as follows:

5.2.1 Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.1 or in accordance with 5.2.2. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

Section 6.4.4 of NFPA 13R is amended to read as follows:

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

Section 6.6.4 of NFPA 13R is amended to read as follows:

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

Section 6.6.6.1 of NFPA 13R is amended to read as follows:

6.6.6.1 Protection of Fuel-Fired Equipment. Where protection of fuel-fired equipment is required by 6.6.4, 6.6.6 and 6.6.7, sprinkler protection shall be provided in accordance with the following:

(1) At least one quick-response sprinkler with a minimum k-factor of 5.6 shall be provided above the fuel-fired equipment. Sprinklers shall be sufficient to cover the fuel-fired equipment protection area, which is equal to the entire perimeter of the fuel-fired equipment when viewed on a plan view.
(2) Where the sprinkler(s) protecting the fuel-fired equipment is located under a ceiling with slope equal to or greater than a 4:12 pitch, a minimum of one sprinkler shall be located above the edge of the fuel-fired equipment protection area, on the upslope side of the equipment.
(3) Freeze protection shall be provided in accordance with 5.4.2.

Section 6.6.7 of NFPA 13R is amended to read as follows:

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

Section 6.7.2.3.2 of NFPA 13R is amended to read as follows:

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

Section 6.8.2 of NFPA 13R is amended to read as follows:

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

Section 6.15 of NFPA 13R is deleted in its entirety.

Section 7.1.1.4 of NFPA 13R is added to read as follows:

7.1.1.4 Systems installed in accordance with the single family residential protection matrix (Section 7.6) shall not require monitoring.

Section 7.6 of NFPA 13R is added to read as follows:

7.6 Protection Matrix for Group R Division 3 Occupancies. When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 7.6 shall be applied.

Table 7.6 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC[4]

Building Area Size Range [6]	Mitigation Residential System Type[1,3]	Separate Sprinkler Lead-in Required [5]	Minimum Underground Pipe Size [5]	Minimum Water Meter Size[5]	Sprinklers Required In Areas Subject To Freezing.
< 3,600 sq.ft.	Standard NFPA 13D [2]	See NFPA 13D for design requirements			
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D [1,2]	See NFPA 13D for design requirements			
> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R [1]	Yes	N/A	N/A	Yes
> 15,000 sq.ft.	Modified NFPA 13 [1]	See NFPA 13 for design requirements			

N/A = Not Applicable

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

7.6.1 Enhanced 13R Design. When Table 7.6 requires an Enhanced 13R design, the sprinkler system shall be designed and installed in accordance with NFPA 13R, except that sprinklers shall be installed throughout the structure except where omissions are permitted by the following:

1. Unheated attic spaces that do not contain fuel fired equipment.
2. Floor/ceiling spaces.
3. Concealed combustible spaces with no access for storage or living purposes.

7.6.2 Other Protection Designs. For other protection designs listed in Table 7.6, see the respective revised codes for NFPA 13 and NFPA 13D minimum design requirements.

Section 8.1.7 of NFPA 13R is amended to read as follows:

8.1.7 Sprinkler plans shall indicate the following:

1. Name of owner and occupant.
2. Location, including street address.
3. Point of compass.
4. Ceiling construction.
5. Full height cross-section or schematic diagram, including structural member information if required for clarify and including ceiling construction and method of protection for nonmetallic piping.

6. Ceiling/roof heights and slopes not shown in the full height cross section.
7. Location of fire walls.
8. Location of partitions, lintels, and doorways. Lintel openings require a cross section view to indicate the area of the opening.
9. Occupancy, label, and name of all areas or rooms.
10. Location and size of concealed spaces, attics, closets, and bathrooms.
11. Any small enclosures in which no sprinklers are to be installed.
12. Size of city main in street; pressure; whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main; and city main test results including elevation of the test hydrant.
13. Make, manufacturer, model, type, heat-response element, temperature rating, sprinkler identification number, nominal K-factor, number of sprinklers installed, and nominal orifice size of the sprinkler.
14. Type and location of horn/strobes.
15. Type of pipe and fittings.
16. Pipe type and schedule of wall thickness.
17. Type of protection for nonmetallic pipe.
18. Nominal pipe size with lengths shown to scale.
19. Location and size of riser nipples.
20. Type of fittings and joints and the location of all welds and bends.
21. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable.
22. All control valves, check valves, drain pipes, and test connections.
23. Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
24. In case of hydraulically designed systems, the information on the hydraulic data nameplate.
25. Name, address, phone number, and contractor's license number of sprinkler contractor.
26. Nevada State Fire Marshal registration number.
27. Signature and NICET number, or engineer's seal, of the designer.
28. General notes as required by the AHJ.
29. Approximate capacity in gallons of each dry pipe system.
30. Make, type, model, and size of alarm or dry pipe valve.
31. Piping provisions for flushing.
32. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
33. A graphic representation of the scale used on all plans.
34. Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
35. The minimum rate of water application (density or flow or discharge pressure), the design area of water application, and the domestic demand.
36. The total quantity of water and the pressure required noted at a common reference point for each system.
37. Relative elevations of sprinklers, junction points, and supply or reference points.
38. Information about backflow preventers (manufacturer, size, type).
39. Information about antifreeze solution used (type and amount).
40. Size and location of hydrants, showing size and number of outlets. Static and residual hydrants that were used in flow tests shall be shown.
41. Size, location, and piping arrangement of fire department connections.

42. Location of fuel-fired equipment and heating and air-conditioning equipment.
43. Location of closets on exterior balconies, and a note indicating whether there is any type of door or penetration between the closet and the dwelling unit.
44. Edition year of NFPA 13R to which the sprinkler system is designed.
45. Utility plans and/or plumbing plans necessary to show connection from water supply to fire sprinkler system.

Section 10.2.2.3 of NFPA 13R is amended to read as follows:

10.2.2.3 When pressure testing in CPVC piping and fittings, the sprinkler system shall be slowly filled with water and the air bled from the highest and farthest sprinkler heads before pressure testing is applied. Air or compressed gas must never be used for pressure testing of CPVC piping and fittings.

"8001.5 NFPA 14, Standard for Installation of Standpipes and Hose Systems" is added to read as follows:

8001.5 NFPA 14, Standard for Installation of Standpipes and Hose Systems. NFPA 14-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Installation of Standpipes and Hose Systems is hereby adopted by reference with the following modifications:

Section 3.3.6 of NFPA 14 is amended to read as follows:

3.3.6 High-Rise Building. A building where the floor of an occupiable story is greater than 55 ft (17 m) above the lowest level of fire department vehicle access.

Section 4.2.3.2 of NFPA 14 is added to read as follows:

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.

Section 4.6.1.1.1 of NFPA 14 is amended to read as follows:

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

Section 4.8.2 of NFPA 14 is amended to read as follows:

4.8.2 Each fire department connection shall have at least two, and not less than one for each 250 gpm of system demand or fraction thereof, 2 ½ inch (65 mm) internal threaded fittings having NHS threads, as specified in NFPA 1963, *Standard for Fire Hose Connections.* Fire Department Connections shall be provided with internal check valve(s) such that water being supplied into any inlet will not flow back out of any other inlet. For the purposes of this section, internal clapper valve devices provided by the manufacturer in listed Fire Department Connections shall be considered internal check valves. *(See Section 7.7 and 7.12 for design requirements)*

Section 4.8.2.3 of NFPA 14 is amended to read as follows:

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

Section 5.2.1.2.1 of NFPA 14 is amended to read as follows:

5.2.1.2.1* Piping volume shall not be limited where the system is designed in accordance with Section 5.2.1.2.2.

Section 5.2.1.2.2 of NFPA 14 is amended to read as follows:

5.2.1.2.2 System design shall be such that water is delivered to the system at the most remote hose connection in not more than 3 minutes, starting at the normal air pressure on the system and at the time of fully opened hose connection.

Section 6.3.2.1 of NFPA 14 is added to read as follows:

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.

Section 6.3.7.1 of NFPA 14 is amended to read as follows:

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

Section 6.4.5.2.2 of NFPA 14 is hereby deleted in its entirety.

Section 6.4.5.3 of NFPA 14 is amended to read as follows:

6.4.5.3 Signs shall be provided at fire department connections, indicating the areas of the building served and the minimum required pressure and flow to be delivered through the inlets. Where a fire department connection services multiple buildings, structures, or locations, the sign shall indicate the buildings, structures, or locations served.

Section 6.4.5.3.1 of NFPA 14 is added to read as follows:

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.

Section 7.2.1 of NFPA 14 is amended to read as follows:

7.2.1 The maximum pressure at any point in the system at any time shall not exceed 350 psi (24 bar), except where components are rated for higher pressures and are approved by an alternative materials and methods report approved by the authority having jurisdiction.

Section 7.2.3.2 of NFPA 14 is amended to read as follows:

7.2.3.2 Where the static pressure at a 2½ in. (65mm) hose connection exceeds 200 psi (13.9 bar), an approved pressure regulating device shall be provided to limit static and residual pressures at the outlet of the hose connection to 200 psi (13.9 bar).

Section 7.2.3.4 of NFPA 14 is added to read as follows:

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.

Section 7.2.4 of NFPA 14 is amended to read as follows:

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 psi (13.9 bar) to any of the multiple hose connections downstream.

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

(5) Pressure-regulating device(s) and the bypass valve shall be installed not more than 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.

(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.

(9) Remote monitoring and supervision for detecting high pressure failure of the pressure of the pressure-regulating device shall be provided in accordance with *NFPA 72, National Fire Alarm Code*. Such failure shall be detected by providing a supervisory flow switch downstream on the pressure relief valve.

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

Section 7.3.2 of NFPA 14 is amended to read as follows:

7.3.2 Class I Systems. Class I systems shall be provided with 2 ½ in. (65 mm) hose connections in the following locations:

(1) At the main floor landing in exit stairways

(2) On each side of the wall adjacent to the exit openings of horizontal exits, unless permitted to be omitted by the Fire Code

(3) In other than covered mall buildings, in each exit passageway at the entrance from the building areas into the passageway

(4) In covered mall buildings, at the entrance to each exit passageway or exit corridor, and at the interior side of public entrances from the exterior to the mall

(5) At the highest landing of stairways with stairway access to a roof, or on roofs with a slope of less than 4 in 12 where stairways do not access the roof

Section 7.3.2.2 of NFPA 14 is amended to read as follows:

7.3.2.2 Class I hose systems shall be designed so that all floor areas of the floor or story are protected by hose valve coverage, with travel distance limited to 100 feet of hose and 30 feet of stream from each hose valve connection.

Section 7.3.3.1 of NFPA 14 is amended to read as follows:

7.3.3.1 Class II systems shall be provided with 1 ½ in. (40 mm) hose stations so that all portions of each floor level of the building or area thereof required to be protected are within 130 ft (39.7 m) of a hose connection provided with 1 ½ in. (40 mm).

Section 7.4 of NFPA 14 is amended to read as follows:

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

Section 7.8.1 of NFPA 14 is amended to read as follows:

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

Section 7.8.1.2 of NFPA 14 is amended to read as follows:

7.8.1.2 Manual standpipe systems shall be designed to provide 125 psi (8.6 bar) at the topmost outlet with the calculations terminating at the fire department connection.

Section 7.9.1.3 of NFPA 14 is added to read as follows:

7.9.1.3 Where pumps are used in structures with an occupied floor located greater than 250 ft in height above the lowest level of fire department access, a redundant fire pump shall be provided for each required fire pump.

Section 7.11.1.1 of NFPA 14 is amended to read as follows:

7.11.1.1 The drain riser shall be equipped with tees that are of the same size as the discharge outlets of the pressure-regulating devices to be tested with internal threaded swivel fitting having NHS threads, as specified in NFPA 1963, *Standard for Fire Hose Connections*, with plugs, and shall be located at every floor with a hose valve pressure-regulating device. A drain connection shall be provided adjacent to every hose valve pressure-regulating device, even if the pressure-regulating device is not on a vertical standpipe riser.

Section 7.11.1.3 of NFPA 14 is added to read as follows:

7.11.1.3 Where drain risers are interconnected and run to a common discharge point, all piping shall be sized for the maximum possible combined flow.

Section 7.12.1.1 of NFPA 14 is amended to read as follows:

7.12.1.1 In buildings with multiple pump zones, each zone shall be provided with an express main and fire department connection from the street to each pump zone.

Section 7.12.2.1 of NFPA 14 is hereby deleted in its entirety.

Section 7.12.3 of NFPA 14 is amended to read as follows:

7.12.3 Fire department connection sizes shall be based on the greater of the sprinkler system demand (if a combined system) or the standpipe system demand and shall include one 2 ½ in. (65 mm) inlet per every 250 gpm (946 L/min).

Section 7.12.3.1 of NFPA 14 is hereby deleted in its entirety.

Section 8.1.1 of NFPA 14 is amended to read as follows:

8.1.1 Plans accurately showing the details and arrangement of the standpipe system shall be furnished to, reviewed, and stamped accepted by the authority having jurisdiction prior to the installation of the system.

Section 8.1.2 of NFPA 14 is amended to read as follows:

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. Provide a detailed narrative describing the scope of work to be conducted associated with the plans.
2. Name of owner and occupant.
3. Location, including street address.
4. Name address, phone number, and contractor's license number of sprinkler contractor.
5. Nevada State Fire Marshal registration number.
6. Signature and NICET number, or engineer's seal, of the designer.
7. General notes as required by the AHJ.
8. Point of compass.
9. The plan must show a top view of all areas on a common architectural scale, i.e. 1/8", 3/16", 1/4", etc. All walls and doors need to be shown, and each room must be labeled according to use. The top view must show supply and drain pipe layout, pipe dimensions, attachments, braces, hangers, standpipe hose outlets, hydraulic nodes, and the coverage area from each hose valve to the remote areas of the floor plan. The coverage area shall be shown on plans and be measured along the path of travel from hose valves, around walls and through doors, to the most remote areas of the floor. The 30 feet distance assigned to the hose stream shall not be allowed to bend or turn.
10. The plan must show section views with a riser diagram to describe the locations of mains, lines, and hose valves within the structure. A minimum of one view is required, although additional views may be necessary to determine compliance with NFPA 14. The section view must be drawn to a common architectural scale, i.e. 1/8", 3/16", 1/4", etc. The riser diagram must indicate all components on the riser, including fire department connections; water supply components, including fire pumps and supply lines; interconnecting horizontal pipe; all standpipes on the system; control valves at the base of all standpipes; hose valves fed by the standpipes; and, where required for testing of pressure regulating valves, the drain lines.
11. The plans shall include an isometric view showing the entire system in one view.
12. A graphic representation of the scale used on all plans.
13. Ceiling construction.
14. Full height cross section.
15. Location of fire walls.
16. Location of horizontal exits.
17. Location of partitions.

18. Label and name of each area or room.
19. General notes shall be provided, as follows:
    a. Indicate compliance with NFPA 14.
    b. Indicate the type of system per Section 5.2 and the class of the system per Section 5.3.
    c. Indicate the minimum and maximum pressure requirements for the system.
    d. Indicate the minimum flow for the system and for each individual valve.
    e. Provide a description of hose valves used, detailing the manufacturer, model number(s), and outlet size.
    f. Manufacturer, schedule and type of piping.
    g. Manufacturer and type of fittings.
    h. Type of freeze protection (building heated, dry system, anti-freeze system, heat-trace, etc).
    i. Indicate the pressure required for the hydrostatic test, being 200 psi or 50 psi about pump churn pressure, whichever is higher.
    j. Indicate the quantity of hose valves shown on the submittal.
20. Underground pipe size, length, location with respect to the building, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade. Show the locations of fire hydrants used for water supply to the fire department connection(s), indicate the test and flow test results and label the test and flow hydrants.
21. Provide information regarding the fire pump, as applicable.
22. Other sources of water supply, including water storage tanks and fire department connections, shall be shown on plans.
23. Size, location, and piping arrangement of fire department connections, with details of the connection.
24. Fire Department Connection Signage: A sign shall be provided adjacent to each FDC indicating what systems are being served, what areas of the building are served, and the minimum required pressure and flow at the Fire Department Connection for correct system operation. Provide a detail of this sign on the plan.
25. Detail of Class I. Class II, or Class III hose valves located in cabinets. The cabinet size, and the placement of items within the cabinet, shall be such to provide a minimum clearance of 6 inches perpendicularly from the face of the valve, a minimum of 1 inch around the circumference of the valve, and a minimum of 6 inches around the circumference of the hose outlet cap.
26. Type of pipe and fittings.
27. Pipe type and schedule of wall thickness.
28. Nominal pipe size with lengths shown to scale.
29. Type of fittings and joints and the location of all welds and bends.
30. Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable.
31. Show hanger locations, and provide details of hanger installations.
32. Seismic bracing information shall be provided, including locations, details, and calculations.
33. Provide details for penetrations of standpipe piping through walls, floors, and other structural members. Show detail to note clearances around the piping and/or locations of flexible connections.
34. Provide details for all penetrations in rated walls and floors, providing information regarding the method of maintaining fire rating of the wall or floor.

35. All control valves, check valves, drain pipes, and test connections.
36. Make, type, model, and size of alarm or dry pipe valve.
37. Piping provisions for flushing and for testing.
38. Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
39. A detail of the hydraulic data nameplate.
40. Hydraulic reference points shown on the plan, including the top view, section view, and isometric view, that correspond with comparable reference points on the hydraulic calculation sheets.
41. The total quantity of water and the pressure required noted at a common reference point for each system.
42. Edition year of NFPA 14 to which the standpipe system is designed.
43. Pressure Reducing Valves: For all pressure reducing valves, including direct-acting and pilot-operated valves, which are shown on the plans, indicate the make, model, and setting of the pressure-reducing valve, and provide a detail for each unique installation configuration.
44. Where direct-acting pressure regulating hose valves are provided anywhere in the building, provide a chart on the plans. The chart shall have eight columns, as follows:
    a. Floor Level – Provide numerical designation for all floor levels in the building.
    b. Static Pressure, Inlet – Indicate the static pressure at the inlet of the hose valve on all floor levels. Provide a supporting hydraulic. calculation at zero flow with churn pressure, providing a node at the hose valve on each floor level to indicate the static pressure at each hose valve.
    c. Residual Pressure, Full Flow, Inlet – Indicate the residual pressure at the inlet of hose valves on each floor. Provide a supporting hydraulic calculation at full standpipe design flow per NFPA 14 (750 or 1,000 gpm), providing a node on each floor level to indicate the residual pressure at each hose valve.
    d. Residual Pressure, 250-gpm flow, inlet - Indicate the residual pressure at the inlet of hose valves on each floor while flowing 250 gpm. Provide a supporting hydraulic calculation at 250 gpm flow at the most remote standpipe outlet, providing a node on each floor level of the most remote standpipe to indicate the residual pressure at each hose valve.
    e. Valve Make and Model – Indicate the manufacturer of the valve on all floors, and the model number for the specific valve. Provide supporting manufacturer specifications.
    f. Valve Setting – Indicate the hose valve setting or bonnet number proposed for each valve. The setting or bonnet number must be associated with the manufacturer specifications for the valve.
    g. Residual Pressure, Full Flow, Outlet – Indicate the residual outlet pressure at the outlet of the hose valve under the full-flow condition. For PRV installations, the residual pressure is taken from pressure relation charts provided by the manufacturer. For non-PRV installation, the residual pressure is taken by analysis of the equivalent lengths of the fittings and the hose valve.
    h. Residual Pressure, 250-gpm flow, Outlet - Indicate the residual outlet pressure at the outlet of the hose valve when flowing 250 gpm. This is necessary to establish the residual pressure expected during field inspection. For PRV installations, the residual pressure is taken from pressure relation charts provided by the manufacturer.

Section 11.5.7.2 of NFPA 14 is amended to read as follows:

11.5.7.2 The system shall deliver a minimum of 250 gpm (946 L/min) at the hose connection within 3 minutes of opening the hose valve.

Section 12.7.2 of NFPA 14 is amended to read as follows:

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

"8001.6 NFPA 20, Standard for Installation of Stationary Pumps for Fire Protection" is added to read as follows:

8001.6 NFPA 20, Standard for Installation of Stationary Pumps for Fire Protection. NFPA 20-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Installation of Stationary Pumps for Fire Protection is hereby adopted by reference with the following modifications:

Section 3.3.24 of NFPA 20 is amended to read as follows:

3.3.24 High-Rise Building. A building where the floor of an occupiable story is greater than 55 ft (16.8 m) above the lowest level of fire department vehicle access.

Section 4.1.1 of NFPA 20 is added to read as follows:

4.1.1 Where a pump is used to provide booster pressure supply to multiple structures, a redundant fire pump shall be provided for each required fire pump.

Section 4.2.1 of NFPA 20 is added to read as follows:

4.2.1.1 A fire pump for fire protection shall be selected to operate at less than or equal to 110 percent of the rated capacity.

Section 4.8.1 of NFPA 20 is amended to read as follows:

4.8.1 A centrifugal fire pump for fire protection shall be selected so that the greatest single demand for any fire protection system connected to the pump is less than or equal to 110 percent of the rated capacity (flow) of the pump.

Section 4.10.1.1 of NFPA 20 is amended to read as follows:

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

Section 4.10.2.1 of NFPA 20 is amended to read as follows:

4.10.2.1 Unless the requirements of 4.10.2.4 are met, a liquid-filled gauge having a dial not less than 3.5 in. (89 mm) in diameter shall be connected to the suction pipe near the pump with a 0.25 in. (6 mm) gauge valve.

Section 4.12.1.3 of NFPA 20 is amended to read as follows:

4.12.1.3 Fire Pump Buildings or Rooms. Fire pump buildings or rooms shall be protected with an automatic sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

Section 4.12.3.1 of NFPA 20 is amended to read as follows:

4.12.3.1 An approved or listed permanently installed (hard-wired for electrically powered devices) source of heat shall be provided for maintaining the temperature of a pump room or pump house above 40° F (5° C).

Section 4.12.4 of NFPA 20 is amended to read as follows:

4.12.4 Normal Lighting. Artificial permanently installed lighting shall be provided in a pump room or house.

Section 4.14.4.1 of NFPA 20 is amended to read as follows:

4.14.4.1 All pumps supplied by municipal water supply shall be installed with a bypass. *(See Figure A.4.14.4).*

Section 5.1.1.3 of NFPA 20 is added to read as follows:

5.1.1.3 Where pumps are used in structures with walking levels greater than 250 ft in height about the lowest level of fire department access, a redundant fire pump shall be provided for each required fire pump.

Section 9.3.1 of NFPA 20 is amended to read as follows:

9.3.1 At least one alternate source of power shall be provided when the requirement of 9.3.3 is not satisfied.

Section 9.3.4 of NFPA 20 is amended to read as follows:

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.

Section 10.2.1 of NFPA 20 is amended to read as follows:

10.2.1 Controllers shall be located as close as is practical to the motors they control and shall be within sight of the motors. Controllers shall be readily accessible by locating controllers near the entrance to the room.

Section 10.4.7.1.1 of NFPA 20 is added to read as follows:

10.4.7.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

Section 12.2.1 of NFPA 20 is amended to read as follows:

12.2.1 Controllers shall be located as close as is practical to the motors they control and shall be within sight of the motors. Controllers shall be readily accessible by locating controllers near the entrance to the room.

Section 12.4.2.1.1 of NFPA 20 is added to read as follows:

12.4.2.1.1 Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

"8001.7 NFPA 22, Standard for Water Tanks for Private Fire Protection" is added to read as follows:

8001.7 NFPA 22, Standard for Water Tanks for Private Fire Protection. NFPA 22-2008 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Water Tanks for Private Fire Protection is hereby adopted by reference with the following modifications:

Section 5.1.1.1 of NFPA 22 is added to read as follows:

5.1.1.1 Steel tanks shall be designed in accordance with AWWA D100, *Welded Steel Tank for Water Storage,* 1996, or AWWA D103, *Factory-Coated Bolted Steel Tanks for Water Storage*, 1997.

Section 14.4.1 of NFPA 22 is amended to read as follows:

14.4.1 A permanent connection to an approved water supply shall be provided to fill the tank. Where the tank serves as a break tank between the city supply and fire pump(s), the fill shall be through automatic fill valves that are tied to water level sensors, and a bypass line of equal size with a normally closed control valve shall be provided.

Section 14.4.2 of NFPA 22 is amended to read as follows:

14.4.2 The means to fill the tank shall be sized to fill the tank in a maximum time of 8 hours. Where the tank serves as a break tank between the city supply and building fire pump(s), the means to fill the tank shall be automatic and shall provide supply flow equal to 150% of the fire pump rated flow.

Section 14.5.5 of NFPA 22 is added to read as follows:

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

Section 14.8.1.1 of NFPA 22 is added to read as follows:

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

"8001.8 NFPA 24, Standard for the Installation of Private Service Mains and Their Appurtenances" is added to read as follows:

8001.8 NFPA 24, Standard for the Installation of Private Service Mains and Their Appurtenances. NFPA 24-2010 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for the Installation of Private Service Mains and Their Appurtenances is hereby adopted by reference with the following modifications:

Section 6.6.2 of NFPA 24 is amended to read as follows:

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

(1) On each bank where a main crosses water

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

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

"8001.9 NFPA 72, National Fire Alarm Code" is added to read as follows:

8001.9 NFPA 72, National Fire Alarm Code. NFPA 72-2013 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association National Fire Alarm Code is hereby adopted by reference with the following modifications:

Section 3.3.99 of NFPA 72 is amended to read as follows:

3.3.99 False Alarm. Activation or reporting of an alarm for which no such alarm condition, fire or emergency actually exists. Additionally, False Alarm is the willful and knowing initiating or transmission of a signal, message or other notification of an event of fire when no such danger exists. See 3.3.307, Unwanted Alarm.

Section 3.3.105.4.2 of NFPA 72 is amended to read as follows:

3.3.105.4.2 ***Dedicated Function Fire Alarm System.*** A protected premises fire alarm system installed specifically to perform emergency control function(s) where a building fire alarm system is not required. Such systems include, but are not limited to sprinkler monitoring systems and elevator recall systems. (SIG-PRO)

Section 10.4.4 of NFPA 72 is amended to read as follows:

10.4.4 In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

Exception No. 1: *Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.*

Exception No. 2: *Dedicated function fire alarm systems shall not be required to have smoke detectors installed above the dedicated function fire alarm control unit.*

Section 12.2.4 of NFPA 72 is amended to read as follows:

12.2.4* The installation of all pathway wiring, cable and equipment shall be in accordance with *NFPA 70, National Electric Code* and the applicable requirements of 12.2.4.1 through 12.2.4.4. In all occupancies, other than residential two stories or less, all wiring, including optical fiber cables, shall be in enclosed metallic conduit or shall be MI, MC, or AC cable. (SIG-FUN)

Section 17.5.3.1 of NFPA 72 is amended to read as follows:

17.5.3.1 Total (Complete) Coverage. Where required by other governing laws, codes, or standards, and unless otherwise modified by 17.5.3.1.1 through 17.5.3.1.5, total coverage shall include all rooms, halls, storage areas, and basements. Attics, lofts, spaces above suspended ceilings, and other subdivisions and accessible spaces as well as the inside of all closets, elevator shafts, enclosed stairways, dumbwaiter shafts, and chutes shall also have

detectors if required by the authority having jurisdiction or to satisfy performance design criteria. Inaccessible areas may not be required to be protected by detectors.

Section 17.5.3.1.6 of NFPA 72 is added to read as follows:

17.5.3.1.6 When area detectors are installed instead of duct smoke detectors to comply with the Uniform Mechanical Code, total coverage is defined as the area served by the air-moving equipment.

Section 17.6.3.5.2 of NFPA 72 is hereby deleted in its entirety.

Section 17.7.3.1.3 of NFPA 72 is amended to read as follows:

17.7.3.1.3 If the intent is to protect against a specific hazard, and the detectors are not otherwise required by this code or other applicable codes, the detector(s) shall be permitted to be installed closer to the hazard in a position where the detector can intercept the smoke.

Section 17.12.2 of NFPA 72 is amended to read as follows:

17.12.2* Activation of the initiating device shall occur between 15 to 60 seconds of waterflow at the alarm-initiating device when flow occurs that is equal or greater than that from a single sprinkler of the smallest orifice size installed in the system.

Section 18.3.2.4 of NFPA 72 is added to read as follows:

18.3.2.4 Voltage drop calculations shall be performed using one of the following methods:

(1) The lump sum calculation method, which shall be calculated as follows:
   (a) Calculate the voltage drop using one of these formulas:
      i. $V_D = I * ((R * 2 * L)/1{,}000)$ **OR**
      ii. $V_D = (2 * K * I * L)/CM$.
   (b) Subtract this calculated voltage drop from 20.4 volts (V_S) in order to get the voltage value at the end of the circuit ($V_S - V_D = V_{EOL}$). The value for V_{EOL} shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

(2) The point-to point method, which requires a math-intensive approach where the voltage drop between each notification appliance is reiterated. This method is best done by utilizing a spreadsheet program. The calculated voltage at the last device on the circuit shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

Where:

V_D = Voltage Drop

V_S = Starting voltage (20.4vdc, or the end of useful battery life)

V_{EOL} = Voltage at the end-of-line resistor

I =Total load of the circuit in amperes utilizing current draws for each notification appliance @ 16vdc (the UL maximum draws at the minimum listed voltage).

R = Resistance in ohms per 1,000 feet, with respect to conductor

K = 10.64 ohms (the constant representing the mil-foot resistance of copper wire)

L = length of circuit in feet (distance from panel to end-of-line resistor for class B circuits)

CM = circular mill of wire, with respect to conductor.

V_{SOURCE} = voltage calculated at the previous device

Wire	R	CM
No 18	7.95	1,620

No 16	4.99	2,580
No 14	3.14	4,110
No 12	1.98	6,530

Section 18.4.1.4 of NFPA 72 is amended to read as follows:

18.4.1.4 Audible notification appliances for alert and evacuation signal tones shall meet the requirements of 18.4.1.5.

Section 18.4.1.5 of NFPA 72 is amended to read as follows:

18.4.1.5 The tone portion of voice messages shall be required to meet the audibility requirements of IFC 907.5.2.1.1. The voice portion of voice messages shall meet the intelligibility requirements of 18.4.10 where voice intelligibility is required.

Section 18.4.1.7 of NFPA 72 is added to read as follows:

18.4.1.7 Critical care areas of health care facilities shall be allowed to have visible notification appliances in lieu of audible notification appliances when approved by the authority having jurisdiction.

Section 18.4.2.4 of NFPA 72 is amended to read as follows:

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.

Section 18.5.5.4.2 of NFPA 72 is amended to read as follows:

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.

Section 18.5.5.6.2 of NFPA 72 is amended to read as follows:

18.5.5.6.2 Documentation provided to the authority having jurisdiction shall be stamped by a licensed engineer and shall include the following:

(1) Inverse Square Law calculations using each of the vertical and horizontal polar distribution angles in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.

(2) The calculations shall account for the effects of polar distribution using one of the following:

a. The percentages from the applicable table(s) in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired,* or equivalent.
b. The actual results of laboratory tests of the specific appliance to be used as recorded by the listing organization.

Section 18.5.5.8 of NFPA 72 is added to read as follows:

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.

Section 21.3.5 of NFPA 72 is amended by deleting the exception to read as follows:

21.3.5* A lobby smoke detector shall be located on the ceiling within 21 ft (6.4 m) of the centerline of each elevator door within the elevator bank under control of the detector.

Section 21.7.2 of NFPA 72 is amended to read as follows:

21.7.2* If connected to the fire alarm system serving the protected premises, all detection devices used to cause the operation of HVAC systems smoke dampers, fire dampers, fan control, smoke doors, and fire doors shall be monitored for integrity in accordance with Section 10.6.9 and Section 12.6. Duct detectors connected to fire alarm systems shall be 24 vdc system-type detectors that are powered by the fire alarm system.

Exception: When duct detectors are installed in locations such as rooftops or other similar areas where extreme temperatures are to be expected, 120 vac duct detectors that are listed for the expected temperatures may be allowed to be installed when approved by the code official, as long as the duct detectors are capable of generating a trouble signal to the FACU if the power is lost, and is capable of generating a supervisory signal to the FACU when the duct detector is activated.

Section 23.2.2.4 of NFPA 72 is amended to read as follows:

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

Section 23.8.5.1.2 of NFPA 72 is amended to read as follows:

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.

Section 23.8.5.9.1 of NFPA 72 is amended to read as follows:

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

Section 23.8.5.9.3 of NFPA 72 is added to read as follows:

23.8.5.9.3 Where fire pumps are required to be monitored and a building fire alarm system is installed, the fire alarm system shall monitor all fire pump signals required at a constantly attended location in accordance with NFPA 20.

Section 23.8.5.9.4 of NFPA 72 is added to read as follows:

23.8.5.9.4 Where fire pumps are required to be monitored and a sprinkler monitoring system is installed, then the sprinkler monitoring system shall monitor all fire pump signals required at a constantly attended location in accordance with NFPA 20.

Section 23.8.6.2 of NFPA 72 is amended to read as follows:

23.8.6.2 Notification Appliances in Exit Stair Enclosures, Exit Passageways, and Elevator Cars. In buildings required to be provided with emergency voice/alarm communications systems notification appliances shall be required in exit stair enclosures, exit passageways, and elevator cars in accordance with 23.8.6.2.1 through 23.8.6.2.4.

Section 23.8.6.2.3 of NFPA 72 is added to read as follows:

23.8.6.2.3 The evacuation signal shall not be required to automatically operate in exit stair enclosures and exit passageways. Manually activated speakers shall be provided in exit stair enclosures and exit passageways in buildings required to have Emergency Voice/Alarm Communication systems in accordance with Section 24.4.

Section 23.8.6.2.4 of NFPA 72 is amended to read as follows:

23.8.6.2.4 The evacuation signal shall not be required to automatically operate in elevator cars. Manually activated speakers shall be provided in elevator cars in buildings required to have Emergency Voice/Alarm Communication systems in accordance with Section 24.4.

Section 23.8.6.3.2 of NFPA 72 is amended to read as follows:

23.8.6.3.2 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over into another notification zone. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

Section 23.8.6.5 of NFPA 72 is added to read as follows:

23.8.6.5 Emergency Voice/Alarm Communication Notification Appliance Circuits. Emergency voice/alarm communication notification appliance circuits shall be capable of full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) as determined in accordance with Sections 23.8.6.5.1, 23.8.6.5.2 or 23.8.6.5.3.

23.8.6.5.1 Power Loss Calculations. A calculation for each circuit shall be provided to the authority having jurisdiction demonstrating simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB). Power loss calculations similar to the following shall be used:

PLoss = 10 * Log [1 - ((2 * RL) / (2 * RL + (VLine squared / PRated))]

RL = (RRef / 1000) * D

With variables defined as follows:

D = length of wire used (in feet)
PLoss = power loss (in dB)
PRated = power driven on line from the amplifier (in watts)
RL = wire gauge resistance (in ohms)

RRef = wire resistance based on gauge of wire used (in ohms/ft.)
VLine = voltage on line (typically 25 volts or 70 volts)

Alternatively the distance may be calculated using a calculation similar to:

D = (61 / RRef) * (VLine squared / PRated)

23.8.6.5.2 Power Loss Tables. To ensure circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB), wiring shall be limited to the distance allowed in Tables 23.8.6.5.2.a and 23.8.6.5.2.b.

Table 23.8.6.5.2.a, 25 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	12	19	31	49	79
150	16	26	41	66	105
100	25	39	62	99	158
75	33	52	83	132	210
60	41	65	104	165	263
50	49	78	124	198	315
40	61	97	155	247	394
30	82	130	207	329	525
25	98	156	248	395	630

Table 23.8.6.5.2.b, 70 V Circuit
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	98	156	248	395	630
150	131	208	331	527	840
100	196	312	497	790	1260
75	262	416	662	1053	1680
60	327	520	828	1317	2100
50	392	624	993	1580	2520
40	491	780	1242	1975	3150
30	654	1039	1656	2633	4200
25	785	1247	1987	3160	5041

*Cable Ohms is expressed in ohms per 1000 feet (2008 NEC Ch.9 Table 8, uncoated, single strand copper)
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.

Section 24.4.2.9.4 of NFPA 72 is added to read as follows:

24.4.2.9.4 The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over the notification zone boundary. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

Section 26.4.7.1.1 of NFPA 72 is added to read as follows:

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

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

Section 29.8.2.2 of NFPA 72 is amended to read as follows:

29.8.2.2* The interconnection of smoke or heat alarms shall comply with the following:

(1) Smoke or heat alarms shall not be interconnected in numbers that exceed the manufacturer's published instructions.
(2) In no case shall more than 18 initiating devices be interconnected (of which 12 can be smoke alarms) where the interconnecting means is not supervised.
(3) In no case shall more than 64 initiating devices be interconnected (of which 42 can be smoke alarms) where the interconnecting means is supervised.

(4) Smoke or heat alarms shall not be interconnected with alarms from other manufacturers unless listed as being compatible with the specific model.
(5) When alarms of different types are interconnected, all interconnected alarms shall produce the appropriate audible response for the phenomena being detected or remain silent.
(6) For applications that require supervision, a listed control unit shall be installed.

"8001.10 NFPA 86, Standard for Ovens and Furnaces" is added to read as follows:

8001.10 NFPA 86, Standard for Ovens and Furnaces. NFPA 86-2011 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Ovens and Furnaces is hereby adopted by reference with the following modifications:

Section 6.3.4.1(A) of NFPA 86 is amended to read as follows:

6.3.4.1(A) Manual Shutoff Valves.

(A) Individual manual shutoff valves for equipment isolation shall be provided for shutoff of the fuel to each piece of equipment. Valves for fuel supply lines shall be located within 6 feet (1829 mm) of the appliance served.

Exception: When approved and the valve is located in the same general area as the appliance served.

"8001.11 NFPA 160, Standard for the Use of Flame Effects Before an Audience" is added to read as follows:

8001.11 NFPA 160, Standard for the Use of Flame Effects Before an Audience. NFPA 160-2011 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for the Use of Flame Effects Before an Audience is hereby adopted by reference with the following modifications:

Section 5.5.1(3) of NFPA 160 is amended to read as follows:

5.5.1(3) An approved fire watch according to IFC Section 901.7.

Section 7.1.6 of NFPA 160 is added to read as follows:

7.1.6 The separation distance between the flame effect and the audience shall be such that the incident thermal radiation received does not exceed that calculated by the following equation:

$T = [35 / q] ^ {1.33}$

Where:

T= time in seconds

q = incident thermal flux in kW/ m^2

The value of q can also be taken from Figure A7.1 of NFPA 160.

When applying the preceding equation to an effect with a duration of 4 seconds or less, the time used in calculating the maximum acceptable level if incident thermal flux shall correspond to the root mean squared (RMS) value of the peak incident thermal flux.

The incident radiation should not cause the surface temperature of the exposed skin of a member of the audience to exceed 111° F (44.0) °C. Incident radiation shall be measured with a radiometer, Skin temperature may also be measured with an infrared surface temperature thermometer or other equivalent means.

Section 8.1.3 of NFPA 160 is added to read as follows:

8.1.3 The operator shall be licensed in accordance with NRS 477 and NAC 477.

"8001.12 NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids" is added to read as follows:

8001.12 NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids. NFPA 385-2007 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Tank Vehicles for Flammable and Combustible Liquids is hereby adopted by reference with the following modifications:

Section 9.2.3 of NFPA 385 is amended to read as follows:

9.2.3 Motors of tank vehicles or motors of auxiliary or portable pumps shall be shut down during the making and breaking of hose connections.

Section 9.2.3.1 of NFPA 385 is amended to read as follows:

9.2.3.1 Where loading or unloading is done without requiring the use of the motor of the tank vehicle, the motor shall be shut down throughout the transfer operations.

Section 9.3.3 of NFPA 385 is amended to read as follows:

9.3.3 Fire extinguishers shall be kept in good operating condition at all times and shall be located in an accessible place on each tank vehicle. During unloading of the tank vehicle, the portable fire extinguisher shall be out of the carrying device on the vehicle and shall be 15 feet (4572 mm) or more from the unloading valves.

"8001.13 NFPA 407, Standard for Aircraft Fuel Servicing" is added to read as follows:

8001.13 NFPA 407, Standard for Aircraft Fuel Servicing. NFPA 407-2012 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for Aircraft Fuel Servicing is hereby adopted by reference with the following modifications:

Section 5.3.4 of NFPA 407 is amended to read as follows:

5.3.4 Emergency fuel shutoff systems shall be operationally checked at intervals not exceeding 3 months. Each individual device shall be checked at least once during every 12-month period.

Section 5.10.1 of NFPA 407 is amended to read as follows:

5.10.1 Aircraft fuel servicing (also called aircraft fuel-transfer operations) shall be performed outdoors. Aircraft fuel servicing incidental to aircraft fuel system maintenance operations shall comply with the requirements of NFPA 410.

Exception: In aircraft hangers built in accordance with the provisions of the International Building Code for Group F-1 occupancies, aircraft fuel transfer operations are allowed where:

1. Necessary to accomplish aircraft fuel-system maintenance operations. Such operations shall be performed in accordance with nationally recognized standards; or
2. The fuel being used has a flash point greater than 100 degrees F.

Section 5.12.3 of NFPA 407 is amended to read as follows:

5.12.3 Parking brakes shall be set on all fuel servicing vehicles or carts before operators begin the fueling operations. At least two chock blocks not less than 5 inches by 5 inches by 12

inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be utilized and positioned in such a manner as to preclude movement of the vehicle in any direction.

Section 5.13.4 of NFPA 407 is amended to read as follows:

5.13.4 Where the open-hose discharge capacity of the fueling system is not more than 200 gallons per minute, a minimum of two listed portable fire extinguishers having a minimum rating of 20-B:C shall be provided. Where the open hose discharge capacity of the aircraft fueling system or equipment is more than 200 gpm but not more than 350 gallons per minute, at least one listed wheeled extinguisher having a rating of not less than 80-B:C and a minimum capacity of 125 lb of agent shall be provided. Where the open hose discharge capacity of the fueling system is more than 350 gallons per minute, a minimum of two listed wheeled extinguishers having a minimum rating of 80 B:C each and a minimum capacity of 125 lb of agent shall be provided.

"8001.14 NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience" is added to read as follows:

8001.14 NFPA 1126, Standard for the Use of Pyrotechnics Before a Proximate Audience. NFPA 1126-2011 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard for the Use of Pyrotechnics Before a Proximate Audience is hereby adopted by reference with the following modifications:

Section 8.1.6.1 of NFPA 1126 is amended to read as follows:

8.1.6.1 Portions of fire detection systems specific and limited to the pyrotechnic effects shall be permitted to be bypassed, only as required to prevent a nuisance alarm during the operation of pyrotechnic effects when the following conditions are met:

(1) Approval of the authority having jurisdiction and as defined on the permit application.
(2) Approval by the owner, venue operator or their agents.
(3) Presence of an approved fire watch capable of directing the operation of all fire detection and life safety systems installed in the building.
(4) Waterflow switches and fire alarm notification systems shall not be permitted to be disabled or bypassed.
(5) System bypass shall only be performed by a licensed fire alarm contractor or an owner's representative as approved by the authority having jurisdiction.

Section 8.1.6.3 of NFPA 1126 is added to read as follows:

8.1.6.3 Indoor pyrotechnic displays shall only be permitted in venues provided with automatic sprinklers throughout.

"8001.15 NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems" is added to read as follows:

8001.15 NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems. NFPA 2001-2011 is available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts, 02269-9101. The National Fire Protection Association Standard on Clean Agent Fire Extinguishing Systems is hereby adopted by reference with the following modifications:

Section 5.1.1 of NFPA 2001 is amended to read as follows:

5.1.1 Specifications. Specifications for total flooding and local application clean agent fire extinguishing systems shall be prepared under the supervision of a person fully experienced and qualified in the design of such systems and with the advice of the AHJ. Starting on January 1, 2012, plans for clean agent extinguishing system installations shall have a wet signature of a minimum NICET Level II designer for Special Hazards Suppression Systems. The specifications shall include all pertinent items necessary for the proper design of the system, such as the designation of the AHJ, variances from the standard to be permitted by the AHJ, design criteria, system sequence of operations, the type and extend of the approval testing to be performed after the installation of the system, and owner training requirements.

Section 5.1.2.2(23) of NFPA 2001 is amended to read as follows:

5.1.2.2(23) Complete step-by-step description of the system sequence of operations, including, but not limited to, the operation of all applicable initiating devices, the operation of audible and visual pre-discharge and post-discharge alarms, functioning of abort and maintenance switches, delay timers, and emergency power shutdown.

Section 5.1.2.2(28) of NFPA 2001 is amended to read as follows:

5.1.2.2(28) Pressure relief vent area, or equivalent leakage area, for the protected enclosure to prevent development, during system discharge, of pressure difference across the enclosure boundaries that exceeds a specified enclosure pressure limit. For clean agent systems that utilize inert gases as the extinguishing agent, an analysis prepared by a licensed engineer that provide vent area calculations shall be submitted and approved.

Section 5.3.7 of NFPA 2001 is amended to read as follows:

5.3.7 The protected enclosure shall have the structural strength and integrity necessary to contain the agent discharge. If the developed pressures present a threat to the structural strength of the enclosure, venting shall be provided to prevent excessive pressures. Designers shall consult system manufacturer's recommended procedures relative to enclosure venting. [For pressure relief vent area or equivalent leakage area, see 5.1.2.2(28)]. For clean agent systems that utilize inert gases as the extinguishing agent, a licensed engineer shall provide a report which includes the pressure relief vent area calculations and includes the design of the overall ventilation system serving the enclosure(s) in order to ensure that the ventilation system will prevent over-pressurization and potential structural damage to the enclosure(s),

IFC APPENDIX B

"B102.1 Definitions" is amended to read as follows:

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

RURAL AREA. For commercial and multi-unit residential buildings, an area that is more than 1 mile (1.6 km) from public water systems capable of providing the required fire flow. For detached single-family dwellings, an area that is more than 1,000 feet (304.8 m) from public water systems capable of providing the required fire flow.

"B103.1 Decreases" is amended to read as follows:

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings, buildings less than 120 square feet in total area, or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical, in accordance with B103.1.1 through B103.1.3.

"B103.1.1 Buildings Less than 2,000 sq ft (186 m^2)" is added to read as follows:

B103.1.1 Buildings Less than 2,000 sq ft (186 m^2). For buildings other than Group A, E, H and I occupancies less than 2,000 sq ft (186m^2) in area, fire-flow is not required where the building is a minimum of 30 feet from all real and assumed property lines. Group A, E, H and I buildings located a minimum of 30 feet from all real and assumed property lines are permitted to be protected with fire sprinklers in lieu of fire flow.

Exception: For detached single-family buildings, the building must be a minimum of 10 feet from all real and assumed property lines.

"B103.1.2 Buildings 2,000 sq ft (186 m^2) or Greater that do not otherwise Require Fire Sprinklers" is added to read as follows:

B103.1.2 Buildings 2,000 sq ft (186 m^2) or Greater that do not otherwise Require Fire Sprinklers. For buildings 2,000 sq ft (186 m^2) or greater where fire sprinklers are not otherwise required, the installation of fire sprinklers in accordance with this code shall be allowed to provide protection in lieu of fire-flow, where the building is a minimum of 30 feet from all real and assumed property lines.

Exception: For detached single-family buildings, the building must be a minimum of 10 feet from all real and assumed property lines.

"B103.1.3 Buildings that Require Fire Sprinklers" is added to read as follows:

B103.1.3 Buildings that require Fire Sprinklers. Where fire sprinklers are otherwise required, on-site fire flow shall be provided without decrease in minimum required flow or duration.

Exception: For detached single family buildings that are required to be sprinklered and are less than 5,000 sq ft, fire flow is not required.

"B105.2 Buildings other than one- and two-family dwellings" is amended to read as follows:

B105.2 Buildings other than one- and two-family dwellings. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings* shall be as specified in Table B105.1.

Exception: For buildings other than high-rise buildings, a reduction in required fire flow of up to 50 percent, as *approved*, is allowed when the building is provided with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. A reduction in the required fire flow of up to 25 percent is permitted in high-rise buildings. The resulting fire flow shall not be less than 1,500 gallons per minute (95678 L/min) for the prescribed duration as specified in table B105.1.

IFC APPENDIX C

"Appendix C Fire Hydrant Locations and Distribution" is amended to read as follows:

Section C101
General

C101.1 Scope. Fire hydrants shall be provided in accordance with this appendix for the protection of buildings, or portions of buildings, as required by Section 507. Design shall comply

with the Clark County Uniform Design and Construction Standards (UDACS) for public installations or NFPA 24 for private installations, as applicable.

Section C102
Location

C102.1 Fire hydrant locations. Fire hydrants shall be provided along required fire apparatus access roads

C102.2 Intersections. The spacing of fire hydrants shall start by placing fire hydrants at all intersections.

C102.3 R-3 Occupancies and single-family dwellings built under the IRC. In all residential areas (R-3 occupancies and single-family dwellings built under the IRC only), hydrants shall be spaced not to exceed 500 feet, 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 Prevention Bureau.

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.

> **Exception:** Water lines under the purview of a public water purveyor that supply both fire service and domestic water demands are not required to comply with C104.1, provided the water lines meet the requirements for supply set forth by the water purveyor.

C104.2 Sectional Control Valve. For systems required to have two sources of water supply per C104.1, sectional control valves shall be installed so that no more than 2 fire hydrants and/or fire sprinkler (per Section 903.1.1 and/or 903.3.1.2 only) lead-ins can be out of service due to a service interruption. For systems permitted to have one source of water supply per C104.1, sectional control valves shall be installed so that no more than 3 fire hydrants and/or fire sprinkler (per Section 903.1.1 and/or 903.3.1.2 only) lead-ins can be out of service due to a service interruption.

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

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

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

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

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

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

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

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

Section C106
Construction Operations

C106.1 Construction Hydrants. Hydrants shall be provided for construction in accordance with Section 3312.

C106.2 Placing hydrant out of service. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Prevention Bureau 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.

IFC APPENDIX K

"Appendix K Proprietary Supervising Station Facilities" is added to read as follows:

Appendix K
Proprietary Supervising Station Facilities

Section K101
General

K101.1 Scope. Proprietary supervising station facilities (self-monitoring facilities) shall meet all of the requirements of this appendix.

K101.2 Permit Required. The proprietary supervising station facility shall maintain an annual operational permit.

Section K102
Site Requirements

K102.1 Location. The proprietary supervising station shall be located in a property's Fire Command Center, or other approved location.

K102.1.1 Equipment. The approved location shall have at a minimum the following items:

1. A fire alarm annunciator that has appropriate control capabilities.
2. An all-call microphone and all-call evacuation switch.
3. Switches that activate the evacuation message, the investigation message (if applicable), and the all-clear message for the active alarm zones.
4. A printer that is provided with a secondary power source such as an uninterruptible power supply or other approved means.
5. Copy of the approved SOP as required by Section K104.

K102.2 Retransmission Means. Two means of retransmission shall be provided. The primary means of retransmission shall be a land-line telephone. The secondary means of retransmission shall be a dedicated cellular telephone.

Section K103
Personnel

K103.1 Qualifications. Proprietary supervising stations shall be operated by trained personnel in constant attendance who are responsible to the owner of the protected property.

K103.1.1 Evidence of training. Annually the applicant shall certify in writing to the *fire code official* that all authorized personnel have received training in the recognition and proper handling of alarm signals. Evidence of annual training for each authorized personnel shall be provided when requested by the *fire code official*.

K103.2 Training. Operators shall be trained on a yearly basis either by the installing fire alarm contractor, by the fire alarm maintenance contractor, or by the manufacturer's representative of installed fire alarm system. Documentation of annual training shall be kept on site and available upon request of the *fire code official*.

Operators shall be trained on the following:

1. How to differentiate between a water flow alarm signal, a fire alarm signal, a fire supervisory signal, and a fire trouble signal.
2. The basic operations of the panel, including but not limited, to the following: signal acknowledgment, resetting of the fire alarm system, selection of evacuation zones, and activating of the evacuation, investigation (if applicable), and all-clear evacuation messaging.
3. The Standard Operating Procedures (SOP's) required by Section K104 for the facility.

K103.3 Number of personnel. At least two operators shall be on duty at all times. One of the two operators shall be permitted to be a runner.

Section K104
Standard Operating Procedures

K104.1 General. A Standard Operating Procedure (SOP) shall be submitted to the *fire code official* when applying for the required annual permit for proprietary supervising station facilities. The SOP shall outline procedures with regards to emergency procedures and the disposition of the alarm, supervisory, and trouble signals. The SOP shall include at a minimum the following items:

1. The number of operators that will be on duty at all times.
2. The location and the equipment found within the proprietary supervising station facility.
3. The facilities' procedures in handling alarm, supervisory, and trouble signals.
4. The following procedures if a positive alarm sequence is provided:
    a. Describe whether positive alarm sequencing is to be utilized, whether an evacuation message will be played, or whether an investigation message will be played for the first 180 seconds after the receipt of a fire alarm signal.
    b. Describe that an evacuation message will automatically activate per the fire alarm operational matrix after 180 seconds if the fire alarm system has not been reset.

Section K105
Disposition of Signals

K105.1 Alarm signals. Upon receipt of a fire alarm signal, the proprietary supervising station operator shall initiate action to perform the following:

1. Immediately dispatch runner to the alarm location identified on the fire alarm control unit.
    a. If the fire is verified, immediately activate the evacuation message on the fire alarm system and initiate notification procedures.
    b. If the alarm is false, the fire alarm system shall be reset. If either an investigation message or an evacuation message has been activated, then sound an all-clear message.

K105.2 Supervisory signals. Upon receipt of a supervisory signal, the proprietary supervising station operator shall initiate action to perform the following:

1. Immediately dispatch runner to the location identified on the fire alarm control unit, unless the supervisory conditions are promptly restored.
2. If unable or unqualified to clear the supervisory signal, then personnel shall contact a fire alarm contractor within two hours to service the fire alarm system.
3. Notify the *fire code official* when sprinkler systems are wholly or partially out of service for eight hours or more.

4. Provide written notice to the *fire code official* as to the nature of the signal, time of occurrence, and restoration of service, when equipment has been out of service for eight hours or more.

K105.3 Trouble signals. Upon receipt of trouble signals or other signals pertaining solely to matters of equipment maintenance of the fire alarm system, the proprietary supervising station operator shall initiate action to perform the following, if required:

1. Immediately dispatch runner to the location identified on the fire alarm control unit, unless the trouble conditions are promptly restored.
2. If unable or unqualified to clear the trouble signal, then personnel shall contact a fire alarm contractor within four hours to service the fire alarm system.
3. Notify the *fire code official* when interruption of service exists for four hours or more.
4. When equipment has been out of service for eight hours or more, provide written notice to the *fire code official* as to the nature of the signal, time of occurrence, and restoration of service.

Section K106
Record-Keeping

K106.1 Alarms. A written log of all fire alarm signals shall be maintained in the Fire Command Center including:

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

IFC APPENDIX L

"Appendix L Fire Protection Systems – Impairments And Systems Out Of Service" is added to read as follows:

Appendix L
FIRE PROTECTION SYSTEMS – IMPAIRMENTS AND SYSTEMS OUT OF SERVICE
Section L101
IMPAIRMENT PROCEDURES

L101.1 General. In addition to the requirements of Section 901.7 alternative protection measures shall be provided in accordance with this Appendix. Tables L102.1 (a) and L102.1 (b) shall be used by the impairment coordinator to determine the alternative protection measurers required.

L101.2 Impairment Coordinator Procedures. For all impairments, both planned and emergency (unplanned), an impairment coordinator shall be designated per Section 901.7.1. An impairment coordinator is the person responsible for maintenance of a particular fire protection system. When an *impairment coordinator* is not designated the *owner* shall be considered the impairment coordinator.

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

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

L101.3 Maintenance Contractor Procedures. The maintenance contractor shall assess the impairment and provide a time estimate for the repair (impairment duration). The impairment coordinator shall use this time estimate and Tables L102.1(a) and L102.1(b) to determine the appropriate actions to take. Where the impairment is discovered during maintenance activities, the maintenance contractor shall contact ownership to request an impairment coordinator. The maintenance contractor shall estimate the time required for repair, and report the impairment in accordance with this section.

L101.4 Impairment Procedure Tables. The impairment coordinator shall comply with impairment tables Tables L102.1 (a) and L102.1 (b). Alternative protection measures are categorized as:

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

L101.4.1 Notify Dispatch. When required by Tables L102.1 (a) and L102.1 (b) the impairment coordinator shall notify the Fire Department dispatch center and fire code official.

L101.4.2 Fire watch. When required by Tables L102.1 (a) and L102.1 (b) the impairment coordinator shall institute a fire watch within the building area where fire protection is impaired for the duration of the impairment. Fire watch shall be in accordance with the Fire Watch Guideline. Fire watch personnel shall be provided at a rate of 1 person per 100,000 square feet of building area, over the entire area of the building affected by the impairment. Fire watch personnel shall meet the following characteristics:

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

L101.4.3 Other Measures. When determined necessary by the Fire Code Official, on a case-by-case basis, the impairment coordinator may be required to implement additional protection measures. The measure(s) available to the *Fire Code Official* include, but are not limited to, the following:

1) Fire Prevention Bureau oversight of Fire Watch.
2) Manning of equipment, such as manual release buttons for deluge systems.
3) Discontinuance of hazardous activities, such as cooking, welding, and pyrotechnic displays.
4) Removing hazard from building, i.e. as removing an airplane from a hangar.
5) Have all fire doors and shutters closed.

6) Manually activate smoke control.
7) Shut down an elevator.
8) Unlock stair door locks.
9) Engine stand-by for supply to fire sprinkler/standpipe system.
10) Partial evacuation of building.
11) Full evacuation of building.

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

L102
Impairment Tables – Use Groups A, E, H, I and R

L102.1 Use Groups A, E, H, I and R. Groups A, E, H, I and R occupancies are deemed a high risk due to the characteristics of these occupancies. As such, alternative protection measurers are tailored on a case-by-case basis in order to manage the risk in these occupancies. The impairment coordinator shall use the following tables L102.1 (a) and L102.1 (b) to address impairments to fire protection systems. When alternative protection measures are required by tables L102.1 (a) and L102.1 (b) the *Fire Code Official* shall be contacted.

TABLE L102.1(a)
SUPPRESSION-BASED SYSTEMS – USE GROUPS A, E, H, I, R

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Fire Pump (standalone)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hour	N	N
		> 3 hour	N	Y
Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground fire service main out of service – redundant main and tank	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 6 hour	N	N
		> 6 hour	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 6 hours	N	N
		> 6 hours	N	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (system still operational)	1	≤ 6 hours	N	N
		> 6 hours	Y	N
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	N
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	N
Sprinkler System Repair/Sprinkler System out of Service	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler system inside the space)	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	Y	N
Clean-agent (without sprinkler system inside the space)	1	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 6 hours	N	N
		> 6 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
	1	≤ 3 hours	Y	N

Impairment Description	Building/ Location Height – Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

TABLE L102.1(b)
FIRE-ALARM SYSTEMS – USE GROUPS A, E, H, I, R

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Main FACU Not Operational (No Stand-alone Nodes)	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 1 hour	Y	Y
Main FACU Not Operational (Stand-alone Nodes are available)	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Node FACU panel is down	1	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 2 hours	Y	N
		> 2 hours	Y	Y
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single notification circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler and fire alarm systems still operational)	1	≤ 12 hours	N	N
		> 12 hours	Y	Y
	2-5	≤ 12 hours	N	N
		> 12 hours	Y	Y
	6 or more	≤ 12 hours	N	N
		> 12 hours	Y	Y
Ground Fault	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	N	N
		> 5 hours	Y	N
Single Notification Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single Detection Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Automatic Doors not Releasing Automatically	1	≤ 2 hours	N	N
		> 2 hours	N	Y
	2-5	≤ 2 hours	N	N
		> 2 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Smoke Control Panel (automatic mode works)	1	≤ 4 hours	N	N
		> 4 hours	N	Y
	2-5	≤ 3 hours	N	N
		> 3 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Smoke Control Panel (automatic mode does not works)	NA	NA	N	Y
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

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

L103
Impairment Tables – Use Groups B, F, M, S

L103.1 Use Groups B, F, M, S. Groups B, F, M and S Occupancies are considered lower hazard occupancies. As such, the impairment guideline is tailored to manage the risks associated with

those occupancies. Mitigation shall be in accordance with Table L103.1(a) and Table L103.1(b).

TABLE L103.1(a)
SUPPRESSION-BASED SYSTEMS – USE GROUPS B, F, M, S

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Fire Pump	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hour	Y	N
		> 2 hour	Y	Y
Fire Pump with back-up fire pump	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 10 hours	N	N
		> 10 hours	N	Y
Feed Main/ Standpipe Out of Service (does not affect sprinkler system supplies)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Feed Main/ Standpipe Out of Service (interrupts supply to more than one sprinkler system)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 2 hour	Y	N
		> 2 hour	Y	Y
Underground fire service main out of service – redundant main and tank	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Underground Supply Out of Service (No secondary water supply)	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Underground Supply Out of Service (built-in secondary water supply)	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 10 hours	N	N
		> 10 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	N	Y
Waterflow switch not functional (system still operational)	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	N
	6 or more	≤ 3 hours	N	N
		> 3 hours	Y	N
Sprinkler System Repair/Sprinkler System out of Service	1	≤ 10 hours	Y	N
		> 10 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water Spray Fixed Systems (NFPA 15)	NA	≤ 8 hours	N	N
		> 8 hours	Y	Y
Foam-water system	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Kitchen exhaust hood and duct extinguishing system	NA	≤ 2 hours	N	N
		> 2 hours	Y	Y
Clean-agent (with sprinkler system inside the space)	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N
		> 8 hours	Y	N
	1	≤ 8 hours	Y	N
		> 8 hours	Y	Y

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Clean-agent (without sprinkler system inside the space)	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
	6 or more	≤ 8 hours	N	N
		> 8 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as secondary supply only	1	≤ 10 hours	N	N
		> 10 hours	N	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply – Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

TABLE L103.1(b)

FIRE ALARM SYSTEMS – USE GROUPS B, F, M, S

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Main FACU Not Operational (No Stand-alone Nodes)	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hour	Y	N
		> 1 hour	Y	Y
Main FACU Not Operational (Stand-alone Nodes are available)	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Node FACU panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 4 hours	Y	N
		> 4 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Strobe power supply is down	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 5 hours	N	N
		> 5 hours	N	Y
Audio Panel is down	1	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 4 hours	Y	N
		> 4 hours	Y	Y
Single detection circuit is down	1	≤ 5 hours	N	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	1	≤ 5 hours	N	N

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
Single alarm circuit is down		> 5 hours	Y	N
	2-5	≤ 5 hours	N	N
		> 5 hours	Y	N
	6 or more	≤ 5 hours	Y	N
		> 5 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Monitoring Panel not operational (fire sprinkler and fire alarm systems still operational)	1	≤ 24 hours	N	N
		> 24 hours	Y	Y
	2-5	≤ 24 hours	N	N
		> 24 hours	Y	Y
	6 or more	≤ 24 hours	N	N
		> 24 hours	Y	Y
Ground Fault	1	≤ 10 hours	N	N
		> 10 hours	Y	N
	2-5	≤ 10 hours	N	N
		> 10 hours	Y	N
	6 or more	≤ 10 hours	N	N
		> 10 hours	Y	N
Single Notification Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single Detection Card in Panel	1	≤ 5 hours	Y	N
		> 5 hours	Y	N
	2-5	≤ 5 hours	Y	N
		> 5 hours	Y	Y

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time [1]	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section L101.4.3
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Recall	1	NA	NA	NA
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Automatic Doors not Releasing Automatically	1	≤ 2 hours	N	N
		> 2 hours	N	Y
	2-5	≤ 2 hours	N	N
		> 2 hours	N	Y
	6 or more	≤ 2 hours	N	N
		> 2 hours	Y	Y
Smoke Control Panel (automatic mode works)	1	≤ 5 hours	N	N
		> 5 hours	N	Y
	2-5	≤ 5 hours	N	N
		> 5 hours	N	Y
	6 or more	≤ 3 hours	N	N
		> 3 hours	N	Y
Smoke Control Panel (automatic mode does not works)	NA	NA	N	Y
Fire fighter communication systems (fire phones and radio systems)	NA	NA	N	Y

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