



**CLARK COUNTY  
AMENDMENTS  
TO THE  
2018 INTERNATIONAL FIRE CODE  
(IFC)**

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NOTE: "SN" Refers to Code Sections amended by the Southern Nevada Consensus Fire Code Amendments

"CC" Refers to Code Sections amended by Clark County Title 13

"SN/CC" Refers to Code Sections amended by both the Southern Nevada Consensus Fire Code Amendments and Clark County Title 13

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# INTERNATIONAL FIRE CODE

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## 101.1 - CC

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

### 101.2.1 - SN/CC

**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 D - Civil Improvement Plan
- Appendix H – Hazardous materials management plan (HMMP) and hazardous materials inventory statement (HMIS) instructions
- Appendix O – Proprietary (self) monitoring, as amended
- Appendix P – Impairment Procedures, as amended
- Appendix Q - Southern Nevada Fire Chiefs Association Approved Guideline for Consumer Fireworks

## 101.6 - CC

**101.6 Supplemental rules and regulations.** The fire code official 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, regulations, 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 - SN

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

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

## 104.9 - CC

**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 approve 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 provisions of this code, and that the material, method or work offered is, for the purposes 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.

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## 104.12 - SN

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

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

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

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

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

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

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

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

### 104.13 - CC

**104.13 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 - CC

**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 106.

### 105.1.3 - CC

**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 106 shall be accumulated to derive the required permit fee.

### 105.1.7 - SN

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

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

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

The following information shall be provided on the certificate:

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

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



development related blasting activities, quarry blasting, construction blasting, or other similar large scale blasting operations.

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

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

### 105.2 - CC

**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, service delivery requested, the property description, and applicant information shall be provided on approved forms. For the full permit fee schedule, see Section 106.

Submittals shall include a minimum of three copies of plans and supporting documentation, unless the associated guideline allows less than three copies. 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 - CC

**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. 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, as evidenced by failure to request an inspection. Before such work recommences, a new permit shall be first obtained and the fee to commence 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.

### 105.6.4 - SN

**Delete Section 105.6.4 Carnivals and Fairs.**

### 105.6.6 - CC

**105.6.6 Combustible dust-producing operations.** An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing combustible dusts at defined in Chapter 2.

**Exception:** Woodworking operations that occupy less than 5,000 square feet and where the dust-producing equipment requires an aggregate dust collection flow rate of less than 1,500 cfm are exempt from a permit.

Table 105.6.8 - SN

**Table 105.6.8**  
**PERMIT AMOUNTS FOR COMPRESSED GASES**

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

### 105.6.13 - CC

**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.

### 105.6.16(6) - CC

6. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and *combustible liquids* are produced, processed, transported, stored, dispensed or used.

**Exception:** Commercial cooking oil

### 105.6.23(2) - CC

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.

### 105.6.27 - SN

**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).
3. Operation of cargo tankers that transport LP-gas.

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### 105.6.32 - CC

**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.

**Exception:** Alcohol based food-warming devices do not require a permit.

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### 105.6.34 - CC

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

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### 105.6.43 - CC

**105.6.43 Repair garages facilities.** An operational permit is require for operation of repair garages

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### 105.6.51 thru 105.6.57 (note 105.6.54 was deleted by ordinance) - SN

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

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

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

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

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

**105.6.57 Wood and plastic pallets.** An operational permit is required for new and existing facilities which store more than 50 idle pallets on site, either inside or outside of a building. See Section 321.

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### 105.6.58 - CC

**105.6.58 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.

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### 105.6.59 - CC

**105.6.59 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.

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### 105.7 - CC

**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

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### 105.7.4 - SN

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

**Exceptions:**

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

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### 105.7.5 - SN

**105.7.5 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<sub>2</sub> 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.

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### 105.7.7 - SN

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

1. Installation of or modification (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.

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### 105.7.19 - CC

**105.7.19 Fire hydrants and associated piping.** A construction permit is required for the installation or modification of fire hydrants and associated piping including fire service mains, sprinkler system laterals and temporary hydrants. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

**Exception:** Public utility fire hydrants do not require fire prevention installation permits where the installation is inspected by the water purveyor

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### 105.7.20 - CC

**105.7.20 Smoke control, smoke removal or smoke exhaust systems control panels.** Construction permits are required for installation of or alteration to smoke control, smoke removal or smoke exhaust systems control panels. Maintenance performed in accordance with this code is not considered to be an alteration and does not require a permit.

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### 105.7.26 thru 105.7.30 (Note 105.7.28 was deleted by ordinance) - SN

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

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

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

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

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

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### 105.7.31 - CC

**105.7.31 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

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### 105.7.32 - CC

**105.7.32 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.

## 105.7.33 - CC

**105.7.33 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.

## 106.6 - CC

**106.6 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 106-A through Table 106-G.2.2.

Table 106-A

Base Fee of \$90 (No Escalation)	
Permit Name	
Aviation Facilities, Aircraft refueling vehicles	LP gases (Commercial aggregate, 30-4,000 gallons)
Battery systems	Lumber yards and woodworking plants
Bond Release	Magnesium/Magnesium Working
Carnivals/Fairs	Miscellaneous Combustible Storage
Cellulose nitrate film	Mobile Food Preparation Vehicle
Combustible Fibers	Mobile Fueling Vehicle
Dry Cleaning Plant (Class IV and V)	Monitoring Facilities
Explosives - Use	Mylar Signature
Filming	Open burning
Fire apparatus access road plan	Proprietary (self) monitoring
Fire Hydrants and Associated Supply Piping - Installation	Pyroxylin (cellulose nitrate) Plastics Storage
Firewood	Radioactive materials
Flame Effects (includes fire performers)	Repair garages and motor vehicle fuel-dispensing station (dispensers)
Floor Finishing	Repair garages and motor vehicle fuel-dispensing station (repair garage)
Fruit and crop ripening	Storage of scrap tires and tire byproducts
Fumigation and thermal insecticidal fogging (business location only)	Tire-rebuilding plants
Heliports, Helistops, and Emergency Landing Pads	Tire Storage
Liquid- or gas-fueled vehicles /equipment in assembly buildings (per event, not per vehicle)	Waste handling
LP gases (Single family residence)	Wood pallets
	Wood products

Table 106-B

<b>\$90 per count of components</b>	
<b>Permit Name</b>	<b>Explanation of Escalation</b>
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 each separate type of device/assembly, 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 106-C(a)

<b>Fee of \$90 per Range Unit, as Determined by Volume of Material per Table 106-C(b)</b>	
<b>Permit Name</b>	
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 aggregate, over 4,000 gallons)
Dry cleaning plants (Classes I, II, IIIA, IIIB)	Organic coatings
Flammable and combustible liquids - Underground Storage/Use	Refrigeration equipment

Table 106-C(b)

<b>PERMIT CALCULATION TABLES - FEE IS \$90 TIMES THE RANGE</b>	
<b>Liquids in Gallons × 3.785 for L</b>	<b>Range</b>
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
<b>Solids by Pounds × 0.4536 for kg</b>	<b>Range</b>
0	0
>0 - <499	1
499 - <1,000	2
1,000 - <2,000	3
2,000 - <3,000	4

PERMIT CALCULATION TABLES - FEE IS \$90 TIMES THE RANGE	
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 × 0.028 for m <sup>3</sup>	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 106-D

SQUARE FOOTAGE TABLES	
FEE IS \$90 TIMES THE RANGE	
SF	RANGE
Permit Threshold - 14,999 sf	1
15,000 sf - 74,999 sf	2
75,000 sf - 149,999 sf	3
150,000 sf and greater	4
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 106-E

FIREWORKS/PYROTECHNICS	
FEE IS \$90 TIMES THE RANGE	
DEVICE COUNT	RANGE
0 - 500 device	1
501 - 1,500 devices	2
1,501 - 2,500 devices	3
2,501 or more devices	4
Permit Name	
Explosives - Fireworks/Pyrotechnics	Pyrotechnic special effects materials - Fireworks/Pyrotechnics

Table 106-F

FIRE PROTECTION SYSTEMS	
FEE IS \$90 PLUS DEVICE ESCALATION BELOW	
Permit Type	Fee
Carbon Dioxide System	\$2.50 per nozzle
Chemical Suppression System	\$2.50 per nozzle
Clean Agent Suppression System	\$2.50 per nozzle
Emergency Responder Radio Coverage System	\$10.00 per antennae
Fire alarm and detection systems, related equipment and dedicated function fire alarm systems (i.e., monitoring)	\$1.00 per device (device is defined as any smoke/heat detector, pull station, duct detector, panel, notification appliance, monitor module, addressable relay, and annunciator)
Fire Pump	\$450 per fire pump
Fire Sprinkler Head, Water Only	\$1.15 per sprinkler head, water only
Foam Suppression System	\$90 per monitor/generator
Foam-Water Fire Sprinkler Head	\$2.00 per sprinkler head, foam-water
In-building riser	\$90 per riser
Smoke Control System Panel	\$180 per panel
Smoke Removal System Panel	\$180 per panel
Standpipe Hose Valves	\$10.00 per hose valve
Two-way Communication System	\$5.00 per call-box
Video Detection Camera	\$90 per camera
Water Monitor	\$90 per monitor
Water Tank	\$360 per tank

Table 106-G

FEES FOR OTHER SERVICES		
SERVICE	FEE	COMMENTS
Base Fee	\$90	Applies to permit fee, hourly rate, etc.
Reinspection fees	\$90 per hour, per person	Minimum one hour, to include travel time. Applies to 2nd reinspection for same deficiencies.
Overtime Inspection fees (Outside of regular work hours)	\$90 per hour, per person	Minimum three hours, to include travel time. Inspections requested outside of regular business hours.
Overtime Inspection fees (Extension of work day)	\$90 per hour, per person	Actual time worked. Minimum one hour, to include travel time.
Same-Day Inspection Fee	\$270	Also responsible for inspector's overtime.
Complaint Inspection fee	\$90 per hour, per person	Minimum one hour, to include travel time. Applies to 3rd inspection visit, and each subsequent re-inspection visit for

FEES FOR OTHER SERVICES		
SERVICE	FEE	COMMENTS
		the same deficiencies.
Inspections or service for which no fee is specifically indicated	\$90 per hour, per person	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 permit or for other situations where requested by the customer, for work to be conducted at the option of the Building Official.
Dedicated Staff Fee	\$150 per hour, per person	For major projects that request that the Director assign one or more inspectors to be available on-site to perform inspections on call, or assign one or more plans reviewers to perform plans review on an expedited fashion. This service is subject to available resources, and requires a preapproved and executed agreement prior to commencement.
Additional plan review fees	\$90 per hour	Minimum one hour. Rounded to next quarter-hour.
Sprinkler Design Flow Test	\$90	To establish basis for fire sprinkler system design
Next Day Plan Review	\$180	Based on \$90 permit fee and \$90 expedite fee, applies to certain plan types only. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
Express Plan Review	\$180	Based on \$90 permit fee and \$90 expedite fee, applies to certain plan types only. Please note this service is subject to staff availability. Turnaround is 5 business days. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
Over-the-counter Review	\$180	Based on \$90 permit fee and \$90 expedite fee, applies to certain plan types only. Applies to reviews conducted while the customer waits (otherwise reverts to Next Day service). Please note this service is subject to staff availability.
Letters of Agreement and other reviews	\$90 per hour	Combustible load-in policy, phased system installation, TCO approval letters, evacuation plans, smoke control/removal recertification reports etc.
Customer-requested reviews	\$90 per hour	Reviews requested by customers not otherwise required by codes
Fire Protection Report - tenant improvement/remodel	\$90 per hour	Per report
Fire Protection Report - Full facility, alternate methods, TCO	\$180, or \$90 per hour, whichever is greater	Per report
Technical Opinion and Report	\$180, or \$90 per hour, whichever is greater	Per report. Includes review of documents for Emergency Planning and Preparedness.
Copies (8½ × 11)	\$1.00 per page for the first 10 pages, \$0.50 each page thereafter of the same document	
Copies (11 × 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	

FEES FOR OTHER SERVICES		
SERVICE	FEE	COMMENTS
	½ hour	
CDs	\$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	\$90 per each 30-day period past the renewable due date	
Extension of unexpired construction permit	\$45 for each extension of time for an unexpired construction permit	Maximum of 1 extension of additional 180 days permitted if request is made prior to expiration of the permit
Apparatus Standby	\$300 per hour	Minimum of 4 hours per apparatus, applied and payable to the Fire Department
Nuisance Alarm Fee	\$500	Payable to the Fire Department
Any additional services not specified herein	\$90 per hour	
Work Without Permits	Permit fee required for immediate plan review, plus 3× hourly rate for inspection of scope of unpermitted work, per person	Fee whenever any work for which a permit is required has been commenced without first obtaining a permit, or where work has been found to exceed the scope of a valid permit

**Table 106-G.1**  
**Service delivery (except Tier 1 and Tier 2**  
**temporary operational permits from Table 106-D)**

20 business-day plan review fee	1× base total permit fee	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 20 business days. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
10 business-day plan review fee	2× base total permit fee, or base total permit fee plus \$90 per hour, whichever 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. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
3 business-day plan review fee	3× base total permit fee, or 2× base total permit fee plus \$90 per hour, whichever 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. Please note

		this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
Immediate plan review fee	5× base total permit fee, or 4× base total permit fee plus \$90 per hour, whichever 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, 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. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
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 106-G.1.1 below.
All revisions of approved plans and all second/subsequent resubmittals	1× base fee at the same service level as the initial submittal	For more aggressive service delivery for all revisions and all second/subsequent resubmittals, see Table 106-G.1.2 below.

Table 106-G.1.1 First Resubmittals

Initial Service	Resubmittal, no charge	Added 1× of base Fee	Added 2× of base Fee	Added 4× of base Fee
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 106-G.1.2 All revisions and second/subsequent resubmittals

Initial Service	Added 1× of base Fee	Added 2× of base Fee	Added 3× of base Fee	Added 5× of base Fee
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 106-G.2

**Service delivery for Range 1 and Range 2  
temporary operational permits from Table 106-D**

10 business-day plan review fee	1× base total permit fee	Base total permit fee, which includes permit and escalating fees, provide for plan review-turnaround in 10 business days. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
5 business-day plan review fee	2× base total permit fee, or base total permit fee plus \$90 per hour, whichever 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. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.

3 business-day plan review fee	3× base total permit fee, or 2× base total permit fee plus \$90 per hour, whichever 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. Please note this service is subject to staff availability. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
Immediate plan review fee	5× base total permit fee, or 4× base total permit fee plus \$90 per hour, whichever 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, 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. Turnaround time shall start on the day of submittal for plans submitted to intake prior to 12:00 PM.
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 106-G.2.1 below.
All revisions of approved plans and all second/subsequent resubmittals	1× base fee at the same service level as the initial submittal	For more aggressive service delivery for all revisions and all second/subsequent resubmittals, see Table 106-G.2.2 below.

Table 106-G.2.1 First Resubmittals

Initial Service	Resubmittal, no charge	Added 1× of base Fee	Added 2× of base Fee	Added 4× of base Fee
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 106-G.2.2 All revisions and second/subsequent resubmittals

Initial Service	Added 1× of base Fee	Added 2× of base Fee	Added 3× of base Fee	Added 5× of base Fee
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

109 - CC

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**SECTION 109 BOARD OF FIRE CODE APPEALS**

**109.1 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.

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

**109.3 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.

**109.4 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.

**109.5 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 within 15 business days of the original determination by 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.

**109.6 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.

**109.7 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.

**109.8 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.

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#### 110.4 - CC

**110.4 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 building code official, or of a permit or certificate used under the provisions of this code, 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.

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#### 110.5 - CC

**110.5 Administrative Citations.** Any person violating any of the provisions, or failing to comply with any of the requirements, of Chapter 13.04 of the Clark County Code, may be issued a civil administrative citation by the building official, or their designated representative authorized to issue misdemeanor citations, or other civil notices, for such violations. The fines schedule for such administrative citation shall be as follows:

- (a) For a first violation, a fine not exceeding \$250.00 plus costs borne by the County
- (b) For subsequent offences within one year of the first offense, a fine not exceeding \$500.00 plus costs borne by the County.

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#### 110.6 - CC

**110.6 Administrative Procedures.** The Administrative Procedures outlined in Title 1, Chapter 1.14.020-1.14.030 shall be same procedures applicable to Chapter 13.04 of the Clark County. For administrative provisions outlined in Title 1, Chapter 1.14.040-1.14.130 which refer to the "Chief of Code Enforcement", the term "Chief of Code Enforcement" shall be replaced with the term "Building Official".

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#### 112.4 - CC

**112.4 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 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.

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#### 202 - SN/CC

### SECTION 202 GENERAL DEFINITIONS

**DECOMMISSIONING.** Planned shut-down which may or may not include removal of a building, system, in whole or part, operation, or use.

**HIGH-RISE BUILDING.** A building with an occupied floor located more than 55 feet (16 764 mm) above the lowest fire department vehicle access. This definition shall apply throughout this code and throughout all referenced codes and standards as stated in Section 102.7 and all applicable standards or requirements that are not set forth in this code as stated in Section 102.8.



**Amendment to portions of the definition for OCCUPANCY CLASSIFICATION**

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

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

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

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

**[BG] 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

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

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

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

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

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

Apartment houses

Condominiums (nontransient)

*Congregate living facilities* (nontransient) with more than 16 occupants

Boarding houses (nontransient)

Convents

*Dormitories*

Fraternities and sororities

Monasteries

Hotels (nontransient)

*Live/work units*

Motels (nontransient)

Vacation timeshare properties

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

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

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

*Congregate living facilities* (nontransient) with 16 or fewer occupants

Boarding houses (nontransient)

Convents

*Dormitories*

Fraternities and sororities

Monasteries



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*Congregate living facilities (transient) with 10 or fewer occupants*  
*Boarding houses (transient)*  
*Lodging houses (transient) with five or fewer guestrooms and 10 or fewer occupants*

**[BG] Care facilities within a dwelling. Care facilities within a dwelling.** Care facilities for 11 or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the International Residential Code.

In facilities that have three or more residents who have difficulty perceiving danger or moving to safety in the event of a fire, the facility must be equipped with a NFPA 13R fire sprinkler system.

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

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

### 307.2 - SN

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**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.

### 307.4.1 - SN

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**307.4.1 Bonfires.** Bonfires are prohibited.

### 307.4.4 - SN

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

### 307.6 - SN

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

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### 308.1.4 - CC

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

**Exceptions:**

1. One- and two-family dwellings
2. Where buildings, balconies and decks are protected by an automatic sprinkler system, open flame cooking devices utilizing natural gas installed under a construction permit issued by the building code official.

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### 308.1.6.2

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

**Exceptions:**

1. LP-gas-fueled devices used for seating pipe joints or removing paint in accordance with Chapter 61.
2. Cutting and welding operations in accordance with Chapter 35.
3. Torches or flame-producing devices in accordance with Section 308.4
4. Candles and open-flame decorative devices in accordance with Section 308.3.
5. Portable stoves used in accordance with their listing and listed by an *approved* nationally recognized testing laboratory per ANSI Z21.72/CSA 11.2 , Portable Type Gas Camp Stoves.

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### 308.1.9 - SN

**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.

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### 308.1.9.1 - SN

**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.

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### 308.1.9.2 - SN

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

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

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

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### 308.1.9.3 - SN

**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*.

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### 308.1.9.4 - SN

**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 manufacturer'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.

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### 308.1.9.5 - SN

**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.

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### 308.3.1 - SN

**Delete Section 308.3.1 Open-flame decorative devices.**

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### 314.4 - SN

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

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

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### 315.3.2.1 - SN

**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 combustibile storage incidental to the use of the occupancy when all of the following are provided:

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

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

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

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

1. Hazardous materials that may be moved through the back-of-house exit access corridor or hallway but prohibited from staging or storage: flammable and combustibile liquids, highly combustibile 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.

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### 315.7 - CC

**315.7 Outdoor pallet storage.** Pallets stored outdoors shall comply with Section 315.7 through 315.7.10. Pallets stored within a building shall be protected in accordance with Chapter 32.

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#### 315.7.2 - CC

**315.7.2 Distance to lot line.** Pallet storage shall not be located within 10 feet (3048 mm), or a distance equal to the stack height, whichever is greater, of a lot line.

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#### 315.7.3 - CC

**315.7.3 Storage height.** Pallet storage shall not exceed a height of 15 feet (4572 mm) or any height restriction set by other ordinances of the jurisdiction, whichever is lower.

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#### 315.7.8 - CC

**315.7.8 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 than 6,200 square feet (576 m<sup>2</sup>) 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.

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#### 315.7.9 - CC

**315.7.9 Fire Hydrants.** Fire hydrants required for fire flow purposes for pallet storage array(s) shall be provided within 300 feet (91 440 mm) of hose lay to all pallets

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#### 315.7.10 - CC

**315.7.10 Fire Department Access.** Fire apparatus access roads in accordance with Section 503 shall be located within 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*.

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### 320 - SN/CC

#### SECTION 320 INDOOR TRADE SHOWS AND EXHIBITIONS

**320.1 General.** Indoor Exposition and Trade Show Facilities are addressed in this section. These include, but are not limited to exhibition halls, convention general sessions, association meetings, product convention showrooms, trade shows with or without booths, and political conventions that constitute temporary assembly uses. An operational permit shall be obtained in accordance with Section 105.6.13

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

##### 320.2.1 Automatic Sprinklers

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

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

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

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

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

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

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

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

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

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

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

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

### 320.3 Decorative Curtains, and Textiles

**320.3.1** Curtains, drapes, and textiles used in temporary exhibitions and trade shows shall comply with Section 320, and shall not be required to comply with Section 807. Curtains, drapes and textiles shall comply with Standard Method of Fire Tests for Flame Propagation of Textiles and Films, NFPA 701, Test Method 2. Compliance shall be indicated by a tag affixed to each curtain, drape, or textile. The tag shall be affixed by the owner of the material after gaining assurance that the material is inherently flame retardant, provided with current flame retardant treatment, or otherwise is compliant with NFPA 701. The tag shall indicate the name of the owner of the material and a statement indicating compliance with the Fire Code. The *fire code official* is authorized to conduct field test in accordance with the current edition of NFPA 705, *Recommended Practice for a Field Flame Test of Textiles and Films*, on any curtain, drape or textile installed.

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

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

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

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

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

**320.3.5** The amount of temporary ceiling hung curtains, drapes or textiles in exhibition spaces equipped throughout with automatic sprinklers shall not be limited and shall comply with 320.3.1 through 320.3.3.

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

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

1. All cooking appliances shall be listed or approved by a nationally recognized testing agency.
2. All cooking equipment is to be operated according to the manufacturers' recommendations and operating instructions. Equipment recommended for outdoor use shall not be used indoors.
3. All cooking equipment (deep fat fryers and woks) operations using combustible oils shall meet all of the following criteria:
  - a. Metal lids sized to cover the horizontal cooking surface are to be provided. The cooking surface is limited to 288 sq in (two sq ft).
  - b. The fryer is to be separated from all other equipment by a distance not less than 24 in.
  - c. These cooking displays must be separated from all other combustibles by a distance not less than 10 ft.
  - d. Deep fat fryers shall be electrically powered and have a shut-off switch.
4. Class-K fire extinguishers shall be provided within 30-ft of each cooking operation in accordance with 904.11.5.
5. Solid fuel cooking equipment shall be protected in accordance with the mechanical code.
6. LP-gas used for displays and demonstrations shall be in accordance with section 6103.2.1.5.

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

1. Overall floor plan (either drawn to scale or dimensioned properly).
2. Egress analysis showing conformance with Chapter 10 of the IFC.

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

## 321 – SN/CC

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### 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 750 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.

#### 401.2 - CC

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**401.2 Approval.** Where required by this code, fire safety plans, emergency procedures and employee training programs shall be approved by the fire code official.

Submittals shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official. The cover sheet of the submittal shall include a signature line by the preparer with the following statement:

“I have prepared this report and by personal knowledge and on-site observation certify that this plan, to the best of my knowledge, complies with the requirements of the code.”

#### 401.9 - CC

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**401.9 Fees for false alarms and nuisance alarms.** In the case of any two false or nuisance alarms, or combination thereof, within a 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.

#### 503.1.1 - CC

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**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. The use of section and half-section public streets in meeting the apparatus access requirements of this section for commercial buildings exceeding 500 total occupant load shall be approved by the fire chief. Where fire apparatus roads and pedestrian walkways are specifically approved to intermingle, a minimum of 5 feet (1524 mm) of pedestrian walkway shall be added on both sides of the fire apparatus road.

**Exceptions:**

1. The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:
  - 1.1 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. Where the building is protected with an 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.
  - 1.2 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 <i>fire code official</i>

- 1.3 Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or similar conditions, and an approved alternative means of fire protection is provided
  - 1.4 There are not more than two Group R-3 or Group U occupancies or single-family dwellings built under the IRC
  - 1.5 For buildings constructed in accordance with high-rise provisions, fire access along two adjoining sides of the building shall be permitted.
- 2 Where approved by the fire code official, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities

**503.2.1 - CC**

**503.2.1 Dimensions.** Fire apparatus access roads shall have an unobstructed width of not less than 24 feet (7,315 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 (4,115 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, 38 feet (11,852 mm) from back-of-curb to back-of-curb for R 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 (9,144 mm), measuring 31 ft (9,448 mm) from back-of-curb to back-of-curb for L curbs, 32 feet (9,752 mm) from back-of-curb to back-of-curb for R curbs, or 33 ft (10,058 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 (7,315 mm), measuring 25 ft (7,620 mm) from back-of-curb to back-of-curb for L curbs, 26 feet (7,924 mm) from back-of-curb to back-of-curb for R curbs, or 27 ft (8,229 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 through parking lots consisting of marked perpendicular and angled parking spaces, such fire apparatus access roads shall have a minimum clear width of 24 feet (7,315 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 - SN

**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 - SN

**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 - SN

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

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### 503.2.8 - SN

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

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### 503.2.9 - SN

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

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### 503.3 - SN

**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  $\frac{3}{4}$  inch. The maximum separation between markings shall be 50 feet, as measured along the centerline of the fire apparatus access lane.

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

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

“ON STREET PARKING IN MARKED FIRE LANES PROHIBITED”

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

“NO PARKING FIRE LANE”

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



TYPE A SIGN



TYPE B SIGN



TYPE C SIGN

**503.4.1 - CC**

**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  $\frac{3}{4}$  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.

#### 503.4.2 - CC

**503.4.2 Bollards.** Bollards obstructing fire apparatus access roads shall be prohibited unless *approved* by the *fire chief*.

**Exception:** Automated bollards approved by the *fire chief*. The location(s), the number permitted, and the activation method shall meet the *approval* of the *fire chief*. An operational test shall be conducted prior to placing the system into operation using Fire Department apparatus.

The *fire code official* is authorized to require the removal from private property any existing bollards that do not comply with this section and has been determined by the *fire chief* to unnecessarily hinder emergency apparatus response.

#### 503.6 - CC

**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 Prevention Bureau. Access gates shall be maintained operational at all times. When electronically controlled gates are out of service, they shall be secured in the open position until repairs are complete. Repairs shall be in accordance with original specifications.

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

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

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

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

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

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

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

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

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#### 505.1 - SN

**505.1 Address Identification.** New and existing buildings shall have *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Where required by the *fire code official*, address identification shall be provided in additional *approved* locations to facilitate emergency response. Address identification shall be in compliance with the requirements of the *fire code official* and the ordinances of the jurisdiction. Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole, or other sign or means shall be used to identify the structure. Address identification shall be maintained.

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#### 505.3 - SN

**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.

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#### 507.1 - SN/CC

**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 Chief. 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.

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#### 507.4 - CC

**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.

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#### 507.5.1 - CC

**507.5.1 Where required.** Fire hydrants shall be required to be located in accordance with Appendix C, as amended

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##### 507.5.1.1 - CC

**507.5.1.1 Hydrant for fire sprinkler or standpipe systems.** Buildings equipped with a fire sprinkler or standpipe system installed in accordance with Section 905 shall have a fire hydrant within 100 feet (30 480 mm) of the fire department connections.

**Exception:** The distance shall be permitted to exceed 100 feet (30 480 mm) where approved by the fire code official

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##### 507.5.1.2 - CC

**507.5.1.2 Locations.** Fire hydrants shall be required to be located in accordance with Appendix C, as amended

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#### 507.5.7 - SN

**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.

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#### 507.5.8 - CC

**507.5.8 Hydrant locks on private hydrants.** Hydrant locks consisting of KNOX locking caps and/or KNOX plugs are permitted to be installed on private hydrants for the purposes of securing private hydrants to prevent theft of water



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**508.1.6 - SN**

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

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

- 13.7 Hazardous material information that includes: location and quantity of hazardous material.
14. A new work table with a minimum size of three (3) feet by seven (7) feet capable of holding plans in an open position.
  15. Generator supervision devices, manual start and transfer features.
  16. Public address system, where specifically required by other sections of this code.
  17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.
  18. Elevator emergency or standby power selector switch(s), 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.

### 508.1 - SN

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

### 508.2 - SN

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

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

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

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

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

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

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

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**SECTION 510****EMERGENCY RESPONDER RADIO COVERAGE SYSTEM**

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

1. **High-rise buildings.** 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. Existing buildings that do not have *approved* radio coverage, as determined by the Fire Chief, in accordance with Section 510.4.1 shall be equipped with such coverage in accordance with Section 510 within a time frame established by the *fire code official*.

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

**Exceptions:**

1. Where *approved* by the *fire code official*, an existing *approved* wired communication system in accordance with Section 907.2.12.2 shall be permitted to be maintained in lieu of an approved radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

**510.3 Permit required.** Construction and operational permits for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Sections 105.6 and 105.7.6. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

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

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

- 510.3.2.1 Plan Submittals.** Plan submittals shall include, but not be limited to all of the following:
- a. A floor plan that indicates the use of all rooms, emergency responder radio coverage system equipment locations, power panel connections, raceway routing layout, conduit and conductor

types and sizes, compliance with survivability criteria and locations of building access to the equipment.

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

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

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

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

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

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

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

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

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

Automatic supervisory signals shall include the following:

Items 1 – 7 are *unchanged*.

8. Supervisory signals required by NFPA 1221.

**510.4.2.7 Pathway Survivability.** The system shall be designed with a designated pathway survivability as described in NFPA 72 Section 24.3.13.8 and NFPA 1221 Section 9.6.2. The *fire code official* shall have the authority to require a fire and non-fire risk analysis be prepared to specify and document the pathway survivability design and installation requirements.

**510.4.2.8 Unchanged.****Exceptions:**

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

**510.4.2.9 Cable.**

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

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

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

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

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

*Items 1 – 8 are unchanged.*

**510.6 Maintenance.** The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections 510.6.1 through 510.6.6.

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

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

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

4. *Unchanged.*
5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the *fire code official*. A copy of this report shall also be maintained on-site for three years.
- 6 The *agency* shall be notified immediately of system impairments in accordance with Appendix P.

**510.6.5 Operational Maintenance.**

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

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

**510.6.6 Fire Department Radios.** The owner shall provide the fire department with portable radios in accordance with this section when the emergency responder radio coverage system is installed in a new building. Radios are not required for existing buildings being retrofitted with an emergency responder radio coverage system.

**510.6.6.1 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.

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

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

#### 603.1.4 - SN

**603.1.4** The grade of fuel oil used in a burner shall be that for which the burner is approved and as stipulated by the burner manufacturer. Oil containing gasoline shall not be used. Waste crankcase oil shall be an acceptable fuel in Group F, M and S occupancies when utilized in equipment listed for use with waste oil and when such equipment is installed in accordance with the manufacturer's instructions and the terms of its listing. For the purposes of this section, the definition of Fuel Oil includes fuels such as diesel that are intended for use in reciprocating internal combustion engines.

#### 603.3.2.2 - SN

**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.

#### 605.5 - SN

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

#### 605.6 - SN

**605.6 Testing of equipment.** Refrigeration equipment and systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code shall be subject to periodic testing in accordance with Section 605.6.1. Records of tests shall be maintained. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

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### 605.7 - SN

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

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### 605.9 - SN

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

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### 605.11 - SN

**605.11 Storage, use and handling.** Flammable and combustible materials shall not be stored in machinery rooms for refrigeration systems having a refrigerant circuit containing more than the allowable quantity of refrigerant as stated in Table 1102.2 of the Uniform Mechanical Code of any other group refrigerant. Storage, use or handling of extra refrigerant or refrigerant oils shall be as required by Chapters 50, 53, 55 and 57.

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

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### 605.16 - SN

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

**Exceptions:**

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

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### 606.1 - SN

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

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### 607.3.5 - SN

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



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### 607.3.6 - SN

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

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### 806.1.1 - SN

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

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

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### 807.1 - SN

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

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

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### 901.2.2 - SN

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

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

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

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### 901.4.3 - CC

**901.4.3 Fire areas.** Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with this chapter, such fire areas shall be separated by fire barriers constructed in accordance with section 707 of the International Building Code or horizontal assemblies constructed in accordance with section 711 of the International Building Code, or both, having a fire-resistance rating of not less than that determined in accordance with Section 707.3.10 of the International Building Code



### 901.4.6 – 901.4.8 – SN/CC

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

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

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

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

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

**Exceptions:**

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

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

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

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

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

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

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

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

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

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

**901.4.7.8 Lighting.** Permanently installed artificial lighting shall be provided in automatic sprinkler system riser rooms.

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

**Exceptions:**

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

## 901.6 - CC

**901.6 Inspection, testing and maintenance.** *Fire protection systems* including fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents 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*.

## 901.7 - CC

**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 P 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 P, 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 P, of the repair time needed.

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### 901.10 - SN

**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.

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### 903.1.1 - SN

**Delete Section 903.1.1 Alternative protection.**

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### 903.2 - SN/CC

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

1. For buildings constructed in accordance with the International Building Code, approved automatic sprinklers systems are required where the building area exceeds 5,000 square feet (464 m<sup>2</sup>).
2. For buildings constructed in accordance with the International Residential Code, approved *automatic sprinkler systems* are required where the living space exceeds 5,000 square feet (464 m<sup>2</sup>).
3. For any buildings, not otherwise requiring fire sprinklers, where the available fire flow does not meet the fire flow requirements of this code, approved *automatic sprinkler systems* shall be provided as required by the *fire code official*.
4. In all occupancies except Group R-3, Group U and occupancies in accordance with the International Residential Code, a building that is more than two stories in height, including any height added by usable floor space, must have an automatic sprinkler system throughout

**Exceptions:**

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

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

**Exceptions:**

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

### 903.2.3 - SN

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

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

### 903.2.8 - CC

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

### 903.2.9.3 - CC

**903.2.9.3 Self-service storage facility (mini-storage).** Self-service storage facilities shall be provided with automatic sprinklers throughout as Ordinary Hazard Group 2 hazard category per NFPA 13.

### 903.2.11.5 - SN

**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 - SN

**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.

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#### 903.3.1.1.1 - SN

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

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Fire service access elevator machine rooms and machinery spaces.
4. Machine rooms, machinery spaces, control rooms and control spaces associated with occupant evacuation elevators designed in accordance with Section 3008 of the *International Building Code*.

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#### 903.3.1.2 - SN

**903.3.1.2 NFPA 13R sprinkler systems.** Automatic sprinkler systems in Group R Occupancies up to and including two stories in height in buildings not exceeding 60 feet (18 288 mm) in height above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R.

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

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#### 903.3.5.3 - SN

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

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#### 903.4 - SN

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

**Exceptions:**

1. Automatic sprinklers systems protecting one- and two-family dwellings.
2. Limited area sprinkler systems in accordance with Section 903.3.8.
3. Automatic sprinklers systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

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#### 903.4.1 - SN

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

**Exceptions:**

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

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

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

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

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

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#### 903.4.2 - SN

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

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#### 903.4.3 - SN

**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.

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#### 903.4.4 - SN

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

## 903.7 - SN

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

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

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

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

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

**Exceptions:**

1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area of the addition where the addition fire area is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the International Building Code, and without openings.
2. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

1. The building has a total area of less than 5,000 sq ft (464 m<sup>2</sup>) and the addition does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. In other than Group H occupancies, the *fire area* containing the addition is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.

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

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

**Exceptions:**



1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the alteration where it is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.
2. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

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

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

**Exceptions:**

1. In other than Group H occupancies, sprinklers are not required to be provided beyond the fire area containing the change of occupancy where it is separated from the remainder of the building by a *fire barrier* constructed in accordance with Section 707 of the *International Building Code*, and without openings.
2. When approved by the *building official*, special hazard areas that are required to be sprinklered for specific uses, such as medical gas rooms, do not require the remainder of the building to be sprinklered.

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

1. The building has a total area of less than 5,000 sq ft (464 m<sup>2</sup>) and the change of occupancy does not cause the existing building to trigger fire sprinkler protection due to occupancy-specific requirements contained in Section 903.
2. In other than Group H occupancies, the *fire area* containing the change of occupancy is separated from adjacent fire areas by a *fire barrier* constructed in accordance with Section 707, and without openings.
3. When approved by the *building official*, a change in occupancy to an equal or lesser hazard shall not require the installation of sprinklers for any part of the building. To make such a determination, the *building official* may consider changes in occupant load, relative fire hazard and other relevant data.



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## 904.2 - SN

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

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### 904.12.5.2 - SN

**904.12.5.2 Extinguishing system service.** Automatic fire-extinguishing systems shall be serviced not less frequently than every 6 months and after activation of the system. Inspection shall be 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*.

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## 905.3 - SN

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

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

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

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### 905.3.1 - SN

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

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

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

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

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### 905.3.3 - SN

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

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

### 905.3.9 - SN

**905.3.9 Building area.** When required by the *fire code official*, buildings in excess of 10,000 square feet (929 m<sup>2</sup>) 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 - SN

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

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

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### 905.4.1 - SN

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

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

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### 905.5 - CC

**905.5 Location of Class II standpipe hose connections.** Class II standpipe hose connections 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. Class II standpipe hose connections shall be located where they will have ready access.

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### 905.9 - CC

**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.

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### 906.2 - SN

**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.

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### 907.1 - SN

**907.1 General.** This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.9 are applicable to existing buildings and structures.

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

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#### 907.1.4 - SN

**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*.

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### 907.2 - SN

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

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

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

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

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

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

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#### 907.2.3.1 - CC

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

1. Approval of the fire code official shall be obtained prior to any conversions or installation. The Key operated devices shall be a listed "institutional" type and not a field modified device.
2. All school staff members shall be trained in the operation of the key operated devices and shall receive a key with obvious markings, for operating the manual pull station. Staff members shall have their key at all times while on school property.

3. The school official shall collect training reports verifying that staff has had training on a quarterly basis and shall be available for review by the fire code official upon request.
4. The Fire Department or Prevention Bureau may conduct unannounced drills or training.
5. Unacceptable performance as evaluated by the fire code official may result in a requirement to convert the devices back to traditional type.

#### 907.2.7.1 - SN

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##### Delete Section 907.2.7.1 Occupant notification

#### 907.2.8.2 - SN

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**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*.

#### 907.2.8.3 - SN

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

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

#### 907.2.8.4 - SN

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

#### 907.2.9.1 - SN

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

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

**Exceptions:**

1. A fire alarm system is not required in buildings not more than two stories in height where all *dwelling units* or *sleeping units* and contiguous attic and crawl spaces are separated from each

- other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
    - 2.1 At least one manual fire alarm box is installed at an approved location.
  3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to exits or are served by open-ended corridors designed in accordance with Section 1027.6, Exception 3.

#### 907.2.9.1.1 - SN

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**907.2.9.1.1 Automatic smoke detection system.** When a fire alarm system is required, an automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed throughout all interior corridors serving dwelling units. For the purposes of this section, interior means a conditioned space.

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

#### 907.2.9.2 - SN

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

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

#### 907.2.9.3 - SN

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

#### 907.2.9.4 - SN

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

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

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

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

### 907.2.12 - SN

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

**Exceptions:**

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

### 907.2.12.1.3 - SN

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

### 907.2.12.2 - SN

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

### 907.2.12.3 - SN

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

### 907.2.12.4 - SN

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



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#### 907.2.24 - SN

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

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

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#### 907.3.1 - SN

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

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#### 907.4.1 - SN

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

**Exceptions:**

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

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#### 907.4.2 - SN

**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.

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#### 907.5.2.1.1 - SN

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

**Exceptions:**

1. Laundry rooms, walk-in closets, storage rooms and walk-in coolers/freezers equal to or less than 100 square feet (9.29 m<sup>2</sup>) in floor area.
2. In lieu of showing an audible notification appliance within a specific occupiable space on the plans, calculations may be provided showing that the alarm signals from the adjacent audible appliances will achieve a minimum of 80 decibels inside and throughout that space, where doors or other barriers between the space and the adjacent audibility device(s) are closed. Sound pressure levels shall be measured during system acceptance testing to verify the calculated space achieves a minimum of 80 dBA.



3. In sleeping areas required to be protected with low-frequency alarms, the 80 dBA minimum sound pressure provision is not required where a listed fire alarm device is not available to simultaneously achieve both the low-frequency signal and the 80 dBA minimum sound pressure.

#### 907.5.2.3.1 - SN

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

**Exceptions:**

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

#### 907.5.2.2.6 - SN

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

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

Table 907.5.2.2.6.1

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

0.80	0.90	Excellent
0.85	0.93	Excellent
0.90	0.95	Excellent
0.95	0.98	Excellent
1.00	1.00	Excellent

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

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

#### 907.6.4.1 - SN

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

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

**Exceptions:**

1. High-rise buildings provided with a fire command center.
  2. Alternate location as approved by the *fire code official*.
2. If a building has a fire riser room with an exterior door, the fire alarm control unit shall be provided within the fire riser room.
- Exceptions:**
1. High-rise buildings provided with a fire command center.
  2. Alternate location as approved by the *fire code official*.
3. The location of an operated initiating device shall be displayed by alphanumeric display at the annunciator.
  4. The alphanumeric display shall state the device type, the floor level (if applicable), the device address and a descriptive location for the operated device(s).
  5. The visible annunciation of the location of operated initiating devices shall not be canceled by the means used to deactivate alarm notification appliances.

#### 907.6.6 - SN

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

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

1. Single- and multiple station smoke alarms required by Section 907.2.10.
2. *Automatic sprinkler systems* in one- and two-family dwellings.
3. Monitoring systems utilizing point-by-point monitoring.

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

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

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

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

#### 907.6.6.3 - SN

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

#### 907.6.7 - SN

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

#### 907.8 - SN

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

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

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

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

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

#### 907.11 - SN

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

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

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

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

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

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

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

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

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

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

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

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### 908.3 - SN

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

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### 909.5.3 - SN

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

**Exceptions:**

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

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

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### 909.16 - SN

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

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#### 909.16.1 - CC

**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

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#### 909.16.2 - CC

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

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#### 909.16.3 - CC

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

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### 909.17 - SN

**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 - SN

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**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 - SN

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**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 - CC

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**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's 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 - SN

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**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.

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### 909.20.5 - SN

**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.

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### 909.21 - CC

#### 909.21 Smoke Control Panel Design

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

**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-I shall be the first smoke zone on the 16 th floor. Note: when the floor level above grade is different than the floor designation, provide both numbers; i.e. if the 3 rd 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 vents. 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 firefighter'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 60 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 three copies of plans for all proposed smoke control graphic panels, three 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.

### 910.3.2.1 - SN

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

### 912.1.1 - SN/CC

**912.1.1 Required sizes.** *Automatic sprinkler systems* with a demand of up to 500 gpm shall be installed with a siamese with two 2½-inch. (65 mm) inlets. *Automatic sprinkler systems* with a demand greater than 500 gpm and an inlet pressure requirement not exceeding 150 psi shall be installed with a single, thread-less coupling consisting of one 5-inch (130 mm) Storz brand locking connection with a 30-45 degree downward deflection. When the system demand exceeds 150 psi, the system shall include one 2½-inch (65 mm) inlet per every 250 gpm (956 L/min) demand. Modifications or alternate designs shall be *approved* by the *fire code official*.

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

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#### 912.4.2 - SN

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

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

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#### 913.1.1 - SN

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

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#### 913.1.2 - SN

**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.

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#### 913.2.3 - SN

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

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#### 914.3.1 - SN/CC

**914.3.1 Automatic sprinkler system.** Buildings and structures shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

**Exception:** An *automatic sprinkler system* shall not be required in *open parking garages* in accordance with Section 406.5 of the International Building Code, where there is no other occupancy above the open parking garage structure and where fire apparatus lanes are immediately adjacent to two open sides of the garage equaling a minimum of 40% of the garage perimeter.

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#### 914.3.2 - SN

**914.3.2 Secondary water supply.** An automatic dedicated secondary on-site water supply having a capacity not less than the hydraulically calculated sprinkler demand, including the hose stream allowance required by NFPA 13, but not less than 15,000 usable gallons, shall be provided for high-rise buildings. An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the *automatic sprinkler system*. The secondary water supply shall have a duration of not less than 30 minutes.

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

- a. For secondary water tanks supplying horizontal split case fire pump(s), or other fire pump(s) that can take a piped water supply, a bypass shall be installed around the secondary water tank to allow for temporary supply to the fire protection system during the repair of the secondary water tank.
- b. For secondary water tanks supplying vertical turbine pump(s), or other fire pump(s) that cannot accept piped supply, the secondary water supply shall be split into two separate tanks, each not less than  $\frac{1}{2}$  of the required water capacity, interconnected by pipe with sectional valves, with redundant pumping and automatic water filling capabilities. This tank arrangement shall be such as to permit one of the two tanks to be drained and have maintenance performed, while maintaining an operational fire protection system for the building served
- c. Alternate engineered solution that provides a water supply while the secondary tank is out of service approved by the *fire code official*

#### 914.4.1 - SN

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

#### 914.6.1 - SN

**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 m<sup>2</sup>) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
2. Sprinklers are not required within portable orchestra enclosures on *stages*.

#### 914.8.3 (exception deleted) - SN

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

918 - CC

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**SECTION 918  
SMOKE REMOVAL**

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

**918.2 Where Required.**

**918.2.1 High rise buildings.** Smoke removal systems shall be installed in accordance with the Building Code.

**918.3 Status Indicators and Controls.**

**918.3.1 Scope.** This section applies to Fire Prevention Bureau requirements regarding the design, installation, operation, and approval for a Firefighter Smoke Removal Panel.

**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.

**918.3.2 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.

**918.3.2.1 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 16 th floor. Note: when the floor level above grade is different than the floor designation, provide both numbers; i.e. if the 3 rd 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.

**918.3.2.2 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.

**918.3.2.3 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.

**918.3.3 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.

**918.3.3.1 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.

**918.3.3.2 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."

**918.3.3.3 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

**918.3.4 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.

**918.3.5 Multiple configurations.** In no case is the smoke removal system required to configure for more than two adjacent smoke removal zones at a time.

**918.3.6 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.

#### **918.3.7 Approval requirements.**

**918.3.7.1 Submittals.** The Fire Prevention Bureau requires a minimum of three copies of plans for all proposed smoke removal panels, three 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.

**918.3.7.2 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.

**918.3.7.3 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.

**918.3.8 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.

**918.4 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.

**918.5 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.

Table 1006.2.1 - SN

TABLE 1006.2.1  
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

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

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

#### 1010.1.8 - SN

**1010.1.8 Door arrangement.** Space between two doors in a series shall be 48 inches (1219 mm) minimum plus the width of a door swinging into the space. Doors in a series shall swing either in the same direction or away from the space between the doors.

**Exceptions:**

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

#### 1029.6.2.3 - SN

**1029.6.2.3 Automatic sprinklers.** Enclosed areas with walls and ceilings in buildings or structures containing *smoke-protected assembly seating* shall be protected with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1.

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



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## Chapter 11 - SN

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

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## 2007.1 - CC

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**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 Section 2007.2 through 2007.9. Helistops and heliports on buildings shall be constructed in accordance with the International Building Code.

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## 2304.2.4.1 - SN

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

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## 2404.2 - SN

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**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.

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## 2810.6 - CC

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**2810.6 Clearance to property line.** Stacks of pallets shall not be stored within a distance equal the stack height or 8 feet (2438 mm) of the property line, whichever is greater, or shall comply with Section 2810.11

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## 2810.7 - CC

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**2810.7 Clearance to important buildings and other on-site storage.** Stacks of pallets shall not be stored within 15 feet (4572 mm) of any important building or other storage on site, or shall comply with Section 2810.11

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## 2810.8 - CC

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**2810.8 Height and stack arrangement.** Pallet stacks shall comply with height and stack arrangement requirements of Section 2810.8.1 through 2810.8.5

**2810.8.1 Height.** Pallet stacks shall not exceed 15 feet (4572 mm) or any height restriction set by other ordinances of the jurisdiction, whichever is lower in height.

**2810.8.2 Individual stack area.** Individual pallet stacks shall cover an area not greater than 400 square feet (37 m<sup>2</sup>).

**2810.8.3 Individual stack separation.** Individual pallet stacks shall be separated by a minimum distance of 8 feet (2440 mm)

**2810.8.4 Stack arrays.** Individual pallet stacks are to be organized into stack arrays having a maximum dimension of 50 feet by 50 feet (15 240 mm by 15 240 mm).

**2810.8.5 Stack array separation.** Pallet storage arrays shall be separated by a minimum distance of 24 feet (7315 mm)

### 2810.9 - CC

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**2810.9 Fire flow, fire hydrants and fire department access.** Fire flow, fire hydrants and fire department access shall be in accordance with Section 2810.9.1 through 2810.9.3.

**2810.9.1 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 than 6,200 square feet (576 m<sup>2</sup>) 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.

**2810.9.2 Fire Hydrants.** Fire hydrants required for fire flow purposes for pallet storage array(s) shall be provided within 300 feet (91 440 mm) of hose lay to all pallets.

**2810.9.3 Fire Department Access.** Fire apparatus access roads in accordance with Section 503 shall be located within 150 feet (45 720 mm) 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*

### 3006.1 - CC

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**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 cannot 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 - CC

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**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 cannot 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)

### 3103.3 - SN

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

### 3103.8.4 - SN

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

### 3103.9 - CC

**3103.9 Structural stability and anchorage required.** Tents or membrane structures and their appurtenances shall be designed and installed to withstand the elements of weather and prevent collapsing. Documentation of structural stability shall be furnished to the fire code official.

**3103.9.1 Structural requirements.** Tents and membrane structures, exceeding one story, or an occupant load of 1,000 or greater, or floor area of 7,500 square feet or greater, shall be designed and constructed to comply with Sections 1606 through 1608 of the International Building Code. Tent and membrane structures shall comply with Table 3103.9.1 for wind loads. Conformance to these code sections for structural stability and anchorage shall be documented by a Nevada-licensed structural engineer. Where a tent is intended to be re-used multiple times, a single structural analysis is permitted, provided the single analysis incorporates the worst-case soil and location conditions within the design. Such single structural analysis is only accepted during the current code edition, and expires when a new code is adopted.

**Exceptions:**

1. Tents and membrane structures installed for 180 consecutive days or more shall comply with Section 1609 of the International Building Code for wind loads
2. Special event structures complying with Section 3105.

**Table 3103.9.1  
Minimum Design Wind Loads and Documentation**

	Duration of Exposure in days <sup>a</sup>	1-7	8-30	31-179
Occupant Load	Floor Area (sq ft)	Minimum Design Wind Speed (mph) <sup>b, c</sup>		
1,000 – 4,999	7,500 or greater	77	83	89
5,000 or greater	All	83	89	Per IBC 1609
All	Exceeding one story	83	89	Per IBC 1609

- a. Duration of occupancy except installation and/or removal unless on the same day
- b. Minimum design wind speed for ASCE 7 wind pressure for Occupancy Category II
- c. Wind speed 3 second gust at 33 ft elevation for Exposure C.

**3103.9.2 Other tents and membrane structures.** Tents and membrane structures that do not exceed one story, 7,500 square feet, or 1,000 occupant load, are permitted to document structural stability by means of conforming to manufacturer installation instructions. Analysis by a Nevada-licensed engineer is not required.

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### 3104.2 - SN

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

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### 3201.3 - SN

**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*.

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### 3310.2 - CC

**3310.2 Key boxes.** Key boxes shall be required as provided by Chapter 5

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### 3310.3 - SN

**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.

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### 3312 - SN

## 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.

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### 3903.3 - SN

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

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### 3905.1.3 - SN

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

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

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### 5001.2.2 - CC

**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.

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### 5001.4 - CC

**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

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### 5001.5.1 - CC

**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 - CC

**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 - CC

**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 - SN

**5003.2.2.1 Design and construction.** Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.
2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.



3. Readily accessible manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:
  - 3.1 The point of use.
  - 3.2 The tank, cylinder or bulk source
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall be clearly visible, accessible and indicated by means of a sign.
5. Backflow prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.

**Exceptions:**

1. Piping for inlet connections designed to prevent backflow.
  2. Piping for pressure relief devices.
6. New and existing remote tank filling connections shall be in accordance with this subsection 6.
    - 6.1 Permanent signs clearly indicating the tank contents associated with each connection port shall be displayed at the remote filling station. Signage shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size color and lettering shall be *approved*.
    - 6.2 The transfer hose connection for liquids that have a pH of 6.0 or less (acidic) shall be equipped with female "Cam-lock" type fittings or other mechanical connection means *approved* by the *fire code official*, sized appropriately.
    - 6.3 The transfer hose connection for liquids that have a pH of 8.0 or greater (basic) shall be equipped with male "Cam-lock" type fittings or other mechanical connection means *approved* by the *fire code official*, sized appropriately.

### 5003.5 - CC

**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

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### 5003.11 - CC

**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

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#### 5003.11.1.1 - SN

**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.

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### 5006 - CC

#### SECTION 5006 RADIOACTIVE MATERIALS

**5006.1 General.** Use and handling of permissible 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 permissible 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.

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### 5305.11 - SN

**5305.11 Temporary Indoor Carbon Dioxide Fog Effects.** Maximum Allowable Quantity of Carbon Dioxide (CO<sub>2</sub>) shall be calculated as follows:

- 1) Calculate Stage Volume: Build an imaginary 'box' over stage that is 10' high and calculate the volume of the 'box'.
- 2) Calculate Allowable Cubic feet of CO<sub>2</sub> within 'box': OSHA allowable short-term exposure limit for CO<sub>2</sub> is 30,000 ppm or 3 %

- 3) Convert volume of CO<sub>2</sub> to pounds by dividing by 8.74 lbs/ft<sup>3</sup> CO<sub>2</sub>
- 4) If the desired amount of CO<sub>2</sub> is less than the allowable calculated amount, then the desired quantity is acceptable
- 5) If more CO<sub>2</sub> is desired, calculate air change rate of venue and determine number of air changes per show.
- 6) Calculate Venue Air Change Rate: Air change rate = venue volume / exhaust rate
- 7) Calculate number of Air Changes: Show length / air change rate
- 8) Calculate the Total Allowable CO<sub>2</sub>: Step 3 above, then multiply by the number of air changes

### 5306.6 - SN

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

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

### 5306.7 - SN

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

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### 5307.3.2 - SN

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

1. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m<sup>3</sup>).
2. Activates an audible and visible alarm within the room or immediate area where the system is installed and stops the flow of carbon dioxide into the piping system upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m<sup>3</sup>).

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### 5601.1.3 - SN

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

**Exceptions:**

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

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### 5601.2.2 - SN

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

**Exception:** Consumer fireworks 1.4G (safe and sane) offered for sale at portable retail fireworks stands that are in accordance with the current "Southern Nevada Fire Chiefs Association Approved Guideline for Fireworks".

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### 5601.2.4 - SN

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

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#### 5601.2.4.1 - SN

**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.

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#### 5601.2.4.2 - SN

**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.

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#### 5601.5 - SN

**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.

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#### 5603.8 - SN

**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.

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#### 5604.1 - SN

**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*.

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#### 5604.6.5 - SN

**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.

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#### 5604.6.5.2 - SN

**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.

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#### 5604.7.1 - SN

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

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

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

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

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#### 5604.7.1.1 - SN

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

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

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#### 5605.1 - SN

**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 phosphoric materials in blasting or pyrotechnic special effects applications in accordance with NFPA 495 or NFPA 1126.
4. Subject to approval of the *fire code official* and obtaining proper approvals from the planning and zoning authority.

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#### 5607.3 - SN

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

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### 5607.3.1 - SN

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

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

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

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

### 5607.3.2 - SN

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

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#### 5607.4 - SN

**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*.

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#### 5607.5 - SN

**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*.

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#### 5607.6 - SN

**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.

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#### 5607.13 - SN

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

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

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#### 5607.13.1 - SN

**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).

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#### 5607.14 - SN

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

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

5608.1 - SN

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**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 - CC

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**5608.2.1 Outdoor fireworks displays.** In addition to the requirements for firewatch personnel, public safety plan and crowd managers 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 - CC

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**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 - CC

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**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 - CC

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**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 - CC

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**5608.4.1 Clearance (fallout areas).** Fallout areas shall be in accordance with NFPA 1123.



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#### 5608.4.2 - CC

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**5608.4.2 Ground pieces.** Ground pieces shall be located not less than 150 feet from spectators, vehicles, tents, canopies or membrane structures.

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#### 5608.11 - CC

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**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.

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#### 5608.12 - CC

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**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 fire chief, building official, or police chief 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

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#### 5608.13 - CC

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**5608.13 Administrative Citations.** Any person violating any of the provisions, or failing to comply with any of the requirements, of Title 13 Section 13.04.260 of this Code, may be issued a civil administrative citation by the fire chief, building official or police chief or their designated representative authorized to issue misdemeanor citations, or other civil notices, for such violations. The fines schedule for such administrative citation shall be as follows:

- (a) For a first violation, a fine not exceeding \$250.00 plus costs including but not limited to disposal costs;
- (b) For subsequent offences within one year of the first offense, a fine not exceeding \$500.00 plus costs including but not limited to disposal costs

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#### 5608.14 - CC

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**5608.14 Administrative Procedures.** The Administrative Procedures outlined in Title 1, Chapter 1.14.020-1.14.030 shall be the same procedures applicable to Chapter 13.04.260. The administrative provisions outlined in Title 1, Chapter 1.14.040-1.14.130 which refer to the "Chief of Code Enforcement" shall be replaced with "Building Official"

5609 - CC

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**SECTION 5609  
CONSUMER FIREWORKS**

**5609.1 General.** Storage, distribution and sales of consumer fireworks shall be in accordance Section 5609, The Southern Nevada Fire Chiefs Association Approved Guideline (written by the Southern Nevada Consumer Fireworks Code Committee) for Consumer Fireworks, and the currently adopted edition of NFPA 1124.

**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, fire code 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 or distribute to the wholesalers for further handling.

**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 fire chief, building official, or police chief, 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. In addition, a disposal fee may be assessed to the party from which illegal fireworks are seized.

**5609.1.4 Administrative Citations.** Any person violating any of the provisions, or failing to comply with any of the requirements, of Title 13 Section 13.04.260 of this Code, may be issued a civil administrative citation by the fire chief, building official or police chief or their designated representative authorized to issue misdemeanor citations, or other civil notices, for such violations. The fines schedule for such administrative citation shall be as follows:

- (a) For a first violation, a fine not exceeding \$250.00 plus costs including but not limited to disposal costs;
- (b) For subsequent offences within one year of the first offense, a fine not exceeding \$500.00 plus costs including but not limited to disposal costs.

**5609.1.5 Administrative Procedures.** The Administrative Procedures outlined in Title 1, Chapter 1.14.020-1.14.030 shall be the same procedures applicable to Chapter 13.04.260. The administrative provisions outlined in Title 1, Chapter 1.14.040-1.14.130 which refer to the "Chief of Code Enforcement" shall be replaced with "Building Official".

**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 and currently adopted codes.

**5609.2.1 Storage for Wholesale Consumer Fireworks.** The storage building/location shall comply with the currently adopted building and fire codes and 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 at an approved location inside or on the fireworks sales stand or stand premises in an approved manner when supervised by an adult that is awake and alert at all times. 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/booth. Signs shall be bilingual (English/Spanish) and shall be painted or stenciled on the stand/booth. The international symbol for "no

smoking” can be stenciled above the exit doors on the exterior or on the exit doors of the stand/booth so if the doors are open the required sign is still displayed.

**5609.3 Safe and Sane consumer fireworks.** All fireworks products for consumer fireworks sales shall be tested (including re-tests) per Section 5609.4 by April 30<sup>th</sup> each year 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/label. Each item or case of small items or item box shall bear the seal/label.

**5609.3.2 Packaging.** Retailers shall display and sell consumer fireworks as they are intended and required to be sold per the wholesaler.

**5609.3.3 Fireworks Construction.** The construction and composition of consumer fireworks shall comply with the currently adopted edition of the American Pyrotechnics Association Standard 87-1 and Standard for Construction and Approval for Transportation of Fireworks, Novelties and Theatrical Pyrotechnics. See Annex C of NFPA 1124.

**5609.4 Fire Prevention Bureau requirements before Testing and Approval.** All consumer fireworks products 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 list of individual products and packages 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 Consumer Fireworks. Items that do not pass testing will not be permitted for sale.

**5609.4.2 Test Method.** Each product selected for testing shall be tested according to the Southern Nevada Fire Chiefs Association Approved Guideline for Consumer Fireworks. The pass/fail criteria will be according to these documents. Additionally, no product shall exhibit re-ignition, burn-out or prolonged burning within thirty (30) 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, witnessed by the Southern Nevada Consumer Fireworks Code Committee, Fire Chief or Police 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/Booths.** Fireworks stands/booths shall be constructed, arranged and have construction and operational features noted in Sections 5609.6.1 through 5609.6.5 and the Southern Nevada Fire Chiefs Association Approved Guideline.

**5609.6.1 Operations.** Fireworks stands/booths shall be operated from July 1 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 unless the stand/booth is approved for 24 hour sales. 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/booths shall be operated by two people and there shall be at least one adult, 18 years or older, and not be occupied by anyone under the age of 16.

**5609.6.4 Construction of Fireworks Stands/Booths:** 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 stands/booths shall be a minimum of 13 feet, 6 inches above grade.
6. Trailers used as fireworks stands/booths may be used when approved.

**5609.6.5 Fire safety features.** Each fireworks stand/booth 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 Nevada State Fire Marshal.
2. “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/booth. Signs shall be bilingual (English/Spanish) and shall be painted or stenciled on the stand/booth. The international symbol for “no smoking” can be stenciled above the exit doors on the exterior or on the exit doors of the stand/booth so if the doors are open the required sign is still displayed.
3. Clear space between the fireworks stand/booth and exposures as noted in Table 5609.6.5:

**Table 5609.6.5**

<b>Minimum Separation Distance from sales stand</b>			
<b>10 feet</b>	<b>20 feet</b>	<b>30 Feet</b>	<b>50 feet</b>
Combustibles (other than dry grass, dry brush, and combustible debris)	Buildings	Dry grass	Motor vehicle fuel dispensers
Vehicle Parking	Fireworks storage	Dry Brush	Propane dispensers
Curb of edge of roadway, street or driveway	Other fireworks stands/booths (permitted to be reduced to 5 feet where the aggregate area of such stands/booths does not exceed 800 square feet. (74 m <sup>2</sup> ))	Combustible Debris	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.
	Tents		

**5609.7 Ignition of fireworks—Hazardous locations.** Ignition of fireworks shall not take place within 300 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 1<sup>st</sup> day of July 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 completed before May 25 and shall be to review applicable code requirements and The Southern Nevada Fire Chiefs Association Approved Guideline for Consumer Fireworks. Each organization running one or more fireworks stands shall attend at least one meeting. Any representative can attend for all stand/booth locations for one organization. If there are more than 3 stands/booths per organization, 2 representatives shall attend the orientation and 1 person per every 3 stand/booths thereafter. Any representative can be available for the inspection of the fireworks stand/booth on the day and time listed on the orientation form

#### 5704.2.9.2.5 - SN

**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 <sup>1</sup>**

Flash Point of Liquid	Largest Tank	Largest Exposed Tank
<140° F	1000 gpm <sup>2</sup>	500 gpm <sup>2</sup>
≥140° F	750 gpm	250 gpm

<sup>1</sup> Required flows may be reduced by half for horizontal tanks

<sup>2</sup> 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

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#### 5704.2.13.1.3 - SN

**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.

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#### 5704.2.13.1.4 - SN

**Delete Section 5704.2.13.1.4 Tanks abandoned in place.**

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#### 5704.5 - SN

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##### 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.

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#### 5706.2.4.4 - SN

**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*.

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#### 5706.5.1.6 - SN

**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.

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#### 5706.5.4.5(1) - SN

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

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

\*2 - 25 remain unchanged.

5806.2 - SN

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**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*.

6104.2 - SN

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

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

80 - SN

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**Chapter 80 REFERENCED STANDARDS, NFPA,**

54-18	National Fuel Gas Code
140-18	Motion Picture and Television Production Studio Soundstages, Approved Production Facilities, and Production Locations... ..322

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## Appendix B

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### B102.1 - CC

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**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) (138 kPa) residual pressure, that is available for fire fighting.

**FIRE-FLOW CALCULATION AREA.** The floor area, in square feet (m<sup>2</sup>), 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 - CC

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**B103.1 Decreases.** The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical, in accordance with B103.1.1 through B103.1.3

#### B103.1.1 - CC

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**B103.1.1 Buildings Less than 2,000 sq ft (186 m<sup>2</sup>).** For buildings other than Group A, E, H and I occupancies less than 2,000 sq ft (186m<sup>2</sup>) in area, fire-flow is not required where the building is a minimum of 30 feet from all real and assumed property lines to property with an existing structure or that can be built upon. 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 to property with an existing structure or that can be built upon.

#### B103.1.2 - CC

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**B103.1.2 Buildings 2,000 sq ft (186 m<sup>2</sup>) or Greater that do not otherwise Require Fire Sprinklers.** For buildings 2,000 sq ft (186 m<sup>2</sup>) 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 to property with an existing structure or that can be built upon.

**Exception:** For detached single-family buildings, the building must be a minimum of 10 feet from all real and assumed property lines to property with an existing structure or that can be built upon.



**B103.1.3 - CC**

**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.

**Table B105.1(1) - CC**

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

FIRE FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	With or without an Automatic sprinkler System	1,000	1
3,601 and greater	No Automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
3,601 and greater	Section 903.3.1.3 of the <i>International Fire Code</i> or Section P2904 of the <i>International Residential Code</i>	$\frac{1}{2}$ value in Table B105.1(2) <sup>a</sup>	1

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

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

**Table B105.2 - SN**

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

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
No <i>automatic sprinkler system</i>	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the <i>International Fire Code</i>	High-rise Buildings: 75% All Other Buildings: 50% of the value in Table B105.1(2) <sup>a</sup>	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the <i>International Fire Code</i>	High-rise Buildings: 75% All Other Buildings: 50% of the value in Table B105.1(2) <sup>a</sup>	Duration in Table B105.1(2) at the reduced flow rate

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

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

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**Appendix C - SN****Delete Existing Appendix C Text and Replace with the Following:****Section C101****General**

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

**Section C102****Location**

**C102.1 Fire hydrant locations.** Fire hydrants shall be provided along required fire apparatus access roads

**C102.2 Intersections.** The spacing of fire hydrants shall start by placing fire hydrants at all intersections.

**C102.3 R-3 Occupancies and single-family dwellings built under the IRC.** In all residential areas (R-3 occupancies and single-family dwellings built under the IRC only), hydrants shall be spaced not to exceed 500 feet, or 600 feet if all homes are protected by approved automatic fire sprinkler systems.

**C102.4 Distance from Hydrant to R-3 Occupancy and single-family dwelling built under the IRC.** The maximum distance from a one- or two-family dwelling to a fire hydrant shall not exceed 300 feet, as measured from an approved point on a street or road frontage to a fire hydrant. An approved point is defined as the property line furthest from the hydrant, at a right angle to the street.

**C102.5 Commercial and Residential Occupancies other than R-3 and single-family dwelling built under the IRC.** In all commercial and industrial areas, including multi-family R-1 and R-2 occupancies, hydrants shall be spaced not to exceed 300 feet, or 400 feet if all buildings are protected by approved *automatic sprinkler systems*.

**C102.6 Distance to Dead-End Street.** The maximum distance from a hydrant to the end of a dead-end street shall not exceed 200 feet.

**C102.7 Distance to a Fire Department Connection (FDC).** The maximum distance from a fire hydrant to a fire department connection (FDC) supplying fire sprinklers and/or standpipes shall not exceed 100 feet, as measured by an approved route. An approved route is defined as an unobstructed path of travel on which hose can easily be laid.

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

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

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

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

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

### **Section C103 Approved Fire Hydrants**

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

### **Section C104 Supply and Underground Mains**

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

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

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

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

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

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

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

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

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

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

### **Section C106 Construction Operations**

**C106.1 Construction Hydrants.** Hydrants shall be provided for construction in accordance with Section 3312.

**C106.2 Placing hydrant out of service.** If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Department prior to placing the hydrant out of service.

### **Section C107 Hydrant Markings**

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

**C107.2 Hydrant Marking Maintenance.** Hydrant marking shall be maintained in accordance with Section 507.

### **Appendix D - CC**

**Delete Existing Appendix D Text and Replace with the Following:**

#### **APPENDIX D**

**D101 Civil Engineering Plans for Water Supply and Fire Department Access.** Civil engineering plans shall follow the requirements of D102 through D105.

**D102 Civil Engineering Plans.** Plans must include the following information:

1. Vicinity map indicating major cross streets adjacent to project, as well as, actual project location.
2. Fire Department General Notes must be provided on plans. These are:

#### **GENERAL NOTES**

##### **GENERAL:**

- a. All work shall be done in strict accordance with the Clark County Fire Code as amended, the Uniform Design and Construction Standards (UDACS) as adopted by Clark County and the currently adopted Edition of NFPA 24.
- b. Fire hydrants and water supplies for fire protection shall be installed, inspected by Fire Prevention and in service prior to and during the time of construction in accordance with Section 3312 of the IFC, as amended. Fire hydrants shall be within 300 feet of combustible materials.
- c. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Clark County Fire Prevention prior to placing the hydrant out of service.

##### **FIRE HYDRANTS:**

- a. Fire hydrants shall be installed in accordance with the most current edition of UDACS, NFPA 24 and this guideline. Fire hydrants shall be maintained in accordance with NFPA 25 and kept in an operative condition with the required water supply.
- b. Manufacturer and model of fire hydrants shall conform to the approved materials list of the water purveyor.
- c. Hydrants shall be installed with their pumper outlet nozzle (steamer connection) facing the fire access road. A 3-foot clear space shall be maintained around the circumference of fire hydrants. Where hydrants are subject to impact by motor vehicles, guard posts (pipe bollards) shall be installed in accordance with Section 312.
- d. Public hydrants shall be painted safety yellow and private hydrants shall be painted red.
- e. Fire hydrants shall be located 4 to 7 feet from back of curb.
- f. Painting of curbs and/or asphalt areas adjacent to hydrants shall be completed by the installer prior to bond release inspection. A coat of exterior industrial grade safety red enamel shall be applied for a minimum of 30 feet (15 feet on each side of the hydrant).
- g. Hydrant locations shall be marked by means of a blue reflective pavement marker installed in the center of the fire access drive lane nearest to the hydrant.

**FIRE DEPARTMENT CONNECTIONS:**

- a. Fire department connections shall be located within 100 feet of a fire hydrant as measured by an approved unobstructed route. An approved route is defined as an unobstructed path of travel on which hose can easily be laid.
- b. Fire department connections shall be located on the fire department access side of buildings, fully visible and recognizable from the access road or nearest point of fire department vehicle access (fire lane) or as otherwise approved by the fire chief.
- c. Fire department connections shall not be closer than 3 feet to any door or window opening and shall not be obstructed by trees, shrubs, parking spaces, etc.
- d. Fire Department connections shall be located not less than 18 inches and not more than 48 inches above the level of the adjacent grade or access level.

**UNDERGROUND PIPING & VALVES:**

- a. Underground piping shall have a minimum working pressure of 150 psi (class 235). Underground piping connected to a fire pump or a fire department connection (FDC) shall have a minimum working pressure of 200 psi (class 305).
- b. For private fire service mains two sources of water supply are required whenever 4 or more fire hydrants and/or fire sprinkler lead-ins are installed on a single system. Water systems under the purview of the Las Vegas Valley Water District shall conform to the Las Vegas Valley Water District rules.
- c. For private fire service mains sectional control valves shall be installed so that no more than 2 fire hydrants and/or fire sprinkler in building risers (lead-ins) can be out of service due to a break in a water main. Water systems under the purview of the Las Vegas Valley Water District shall conform to the Las Vegas Valley Water District rules.
- d. All piping and valves supplying fire sprinkler systems shall be protected from freezing when exposed to temperatures less than 40° F. Freeze protection shall be approved by Clark County Fire Prevention and be durable and permanent.
- e. All required hydrostatic testing and flushing of the private fire service main or underground fire sprinkler/standpipe water supply piping shall be performed in the presence of Clark County Fire Prevention staff. The piping joints shall be uncovered until inspected. The installing contractor shall furnish a "contractor's material and testing certificate" (CM&T) countersigned by the property owner or representative. The CM&T shall be filled out completely with the inspector's initials, witnessing each test. A copy of the underground flush and hydrostatic testing documentation shall be on-site and signed prior to the connection of the underground water supply to the fire sprinkler system.

**GATES:**

- a. Shop drawings for all gates and motorized openers serving fire department access roads shall be submitted separately under a separate permit for review by the Clark County Building Department and Fire Prevention and receive approval prior to their installation.

**FIRE APPARATUS ACCESS ROADS:**

- a. Speed bumps and/or speed humps shall not be permitted within the required width of fire apparatus access roads.

**Exceptions:**

1. Speed humps are allowed on private fire apparatus access roads serving commercial and industrial buildings when approved by the fire code official.
  2. Rumble strips are allowed on private fire apparatus access roads serving residential, commercial and industrial buildings when approved by the fire code official.
- b. A maximum of six (6) single family homes (IBC Group R-3) or structures constructed in accordance with the IRC, may be situated on a 25 foot wide street (stub street) having a maximum length of 150 feet when all homes are provided with an approved automatic sprinkler system. The minimum width shall be 25 feet measured from back-of-curb to back-of-curb and on-street parking shall be prohibited on such stub streets.

- c. 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.
- d. Fire apparatus access roads including elevated portions shall be designed with a ground bearing capacity not less than 75 psi over the ground contact area

**END OF GENERAL NOTES**

- 3. A Fire Prevention completed signature block on all utility sheets to be reviewed by Fire Prevention shall be provided as follows:

***Approval of these plans shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of the state or county laws. Fire Flow = \_\_\_\_\_ g.p.m. at 20 psi residual.***

- 4. A completed Fire Flow Information Block shall be provided as follows:

FIRE FLOW INFORMATION	
TYPE OF CONSTRUCTION	
TOTAL LIVING AREA (residential sq ft)	
TOTAL AREA (sq ft)	
NUMBER OF STORIES	
TYPE IA OR IB CONSTRUCTION: AREA OF THREE (3) LARGEST FLOORS	
BUILDING HEIGHT (ft)	
HIGH RISE BUILDING	___ YES ___ NO
IBC USE GROUP	
SPRINKLERED	___ YES ___ NO
NUMBER OF HYDRANTS INSTALLED	
FIRE-FLOW ON-SITE	
TOTAL FIRE FLOW	_____ GPM AT 20 PSI

- 5. Locations of water main connections, stubs, etc.
- 6. Size and location of all underground fire sprinkler system laterals.
- 7. Location, size, and type of new and existing water mains.
- 8. Location, number, and type of new, relocated and existing fire hydrants.
- 9. Location of sectional and control valves.
- 10. Locations, size and type of new/existing DCDAs/RPDA and water meter assemblies.
- 11. Details of thrust blocks in accordance with UDACS and NFPA 24.
- 12. Curb lines, sidewalks, alleys, driveways, walls, fences, property lines, vehicle parking layouts (indicate whether or not parking is covered or uncovered), power poles, adjacent structures, all on-site buildings, any other items which are pertinent to hydrant placement.
- 13. Emergency vehicle access plan indicating fire apparatus access road on and off property, in accordance with the Fire Code. Fire apparatus access road widths must be provided, including details of all street sections.

**D103 Fire Hydrant System Design/Distribution/Frequency**

**D103.1** When four or more hydrants are provided on a private system require, two sources of water are required. Public hydrants are supplied according to the requirements of the water purveyor.

**D103.2** The spacing of fire hydrants shall place hydrants at all intersections.

**D103.3** Hydrants should be on the right side of the street (from the perspective of travel into the property) and should be inside the dead-end street when those occur. If the hydrant is not within spacing requirements to a dead-end, then an additional hydrant is required to meet the spacing requirements. There are no limitations on how close a hydrant can be to the dead-end.

**D103.4** In residential areas (R-3 occupancies and single family dwellings built under the *International Residential Code* - IRC only) hydrants shall be spaced not to exceed 500 feet apart, or 600 feet apart, if buildings are protected by approved automatic fire sprinkler systems.

**D103.5** 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.

**D103.6** For all occupancies other than R-3 and single family dwellings built under the IRC, hydrants shall be spaced not to exceed 300 feet or 400 feet if buildings are protected by approved automatic fire sprinkler systems.

**D103.7** In all commercial, industrial and multi-family residential (R-1 and R-2 occupancies) areas, the maximum distance from a hydrant to the end of a dead-end street shall not exceed 200 feet (C102.6).

**D103.8** The minimum number of fire hydrants required to meet the fire flow shall be based on a maximum flow of 1,500 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 (C105.1).

**D103.9** Fire hydrants on adjacent properties shall not be considered unless fire apparatus access roads extend between properties and recorded easements are established.

**D103.10** Where projects are built adjacent to street(s) provided with median dividers, or streets having four or more travel lanes and a traffic count of 30,000 vehicles per day, hydrants shall be added along such streets to achieve a maximum spacing of 1000 feet along both sides of the street, arranged on an alternating basis of 500 feet intervals.

**D103.11** 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.

**D103.12** Hydrants shall not be placed in the circular portion of a cul-de-sac per Las Vegas Valley Water District (LVVWD) Uniform Design Standards 2.21.01.

**D103.13** Sectional control valves shall be installed so that no more than 2 fire hydrants and/or 2 sprinkler lead-ins can be out of service at any one time.

**D103.14** 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, or where curbs are not provided, the hydrant shall be protected against vehicular impact in accordance with Section 312.

**D103.15** Hydrants shall be located a minimum of 6 feet away from the beginning of a turning radius (LVVWD UDS 2.21.01).

**D103.16** Any control valves in the fire sprinkler lateral must be post indicator valve (PIV) type and electrically supervised.

**Exception:** When prior approval is obtained from the Clark County Fire Prevention, gate valves in underground water lines may be abandoned in place. The Clark County Fire Prevention must witness abandonment of the valve.



**D103.17** Hydrants shall be provided during construction as soon as combustible materials arrive on-site in accordance with Section 3312.

**D103.18** If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Clark County Fire Prevention prior to placing the hydrant out of service.

**D103.19** Supply lines feeding multiple fire hydrants shall have a minimum diameter of 8 inches. A supply line may be reduced to a diameter of 6 inches provided it supplies only one hydrant and has a maximum length of 150 feet.

#### **D104 Fire Hydrant Installation Specifications**

**D104.1** Fire hydrant installation shall be as follows:

Existing. When property with existing fire hydrant protection is further developed or changed, and such change or development requires an increased fire flow than what the original fire system provides, the existing fire hydrants are required to be upgraded to meet the current requirements.

**D104.2** Fire hydrant painting and marking: Public hydrants shall be painted safety yellow and private shall be painted red. Their locations shall be marked in the adjacent fire apparatus access road by a blue reflective pavement marker and the curbs shall be painted red 15 feet on each side of the hydrant. Where curbs are not provided, paint shall be applied along the roadside for 15 feet in each direction.

**D104.3** All cap, hose nozzle and pumper nozzle threads shall be free of dirt, rust, etc., and shall be lightly greased.

**D104.4** Protection of fire hydrants from vehicular impact: Where a hydrant is located less than 4 feet from the back of the curb, or where curbs are not provided, protective posts shall be installed.

**D104.5** Hydrants shall be installed so that the breakaway flange is located no higher than 6 inches nor less than 2 inches from the 3' x 3' x 10" concrete pad which is reinforced with a minimum of #4 rebar installed throughout the pad (UDACS 40).

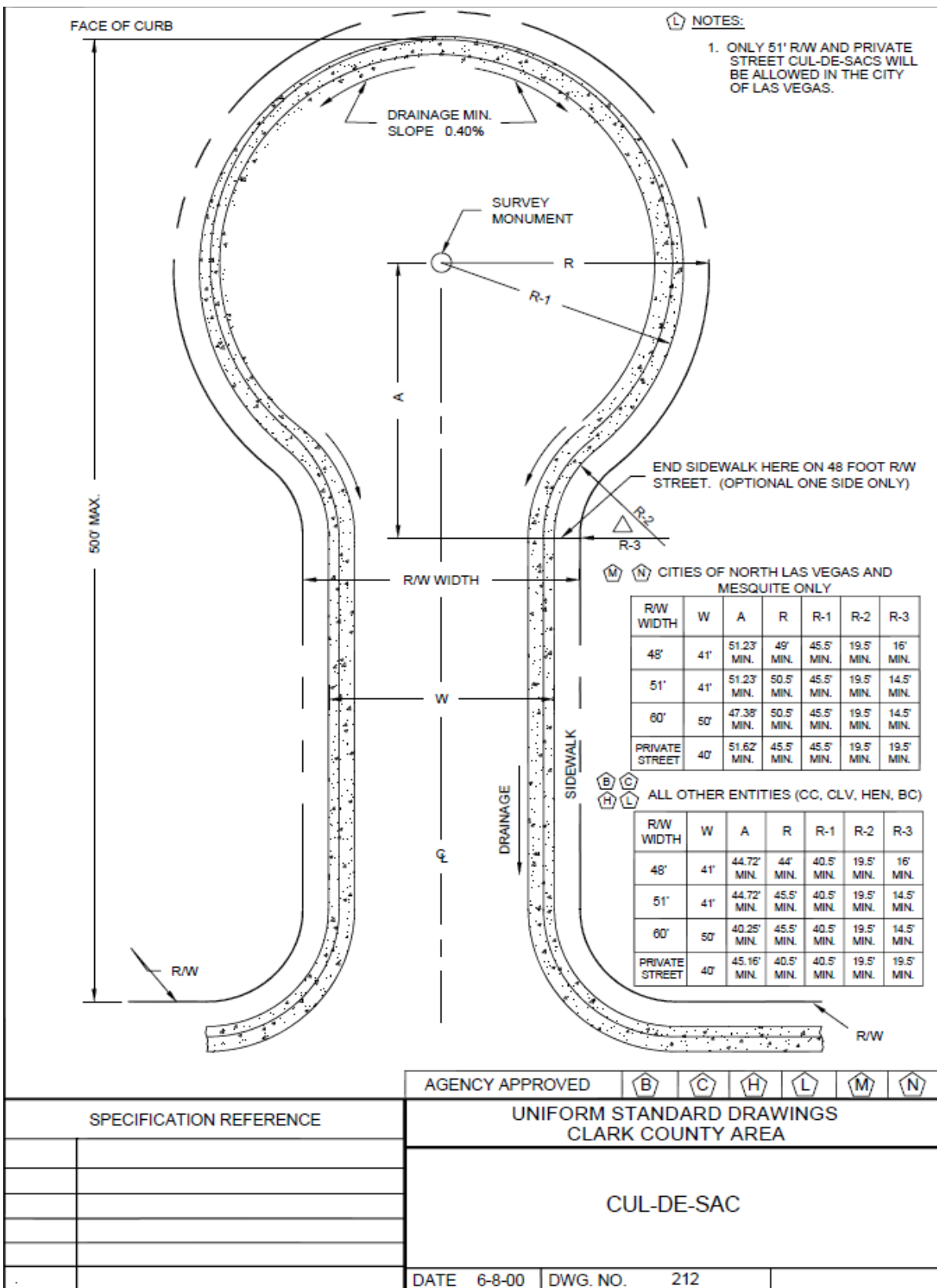
**D104.6** Approved Fire Hydrants: Hydrants that are proposed for installation in public water systems shall be in accordance with approved fire hydrants as allowed by the water purveyor. Hydrants proposed for installation on private water systems shall also be in accordance with the hydrants approved by the water purveyor.

#### **D105 Fire Apparatus Access Roads**

**D105.1** Fire apparatus roads are to comply with Section 503.

**D105.2** Dead ends: Dead-end fire apparatus access roads in excess of 150 feet (45,720 mm) in length shall be provided with approved provisions for the turning around of fire apparatus. Dead-end streets up to 500 feet long, measured from curb face of the intersecting street to the curb face of the dead-end (cul-de-sac, hammerhead), shall use the approved cul-de-sac dimensions provided in the Clark County Regional Transportation Commission (RTC) standard drawings RTC 212 or RTC 212.1.S.1 as follows. Dead-end streets in excess of 500 feet must use one of the Clark County Fire Department approved fire apparatus turn around designs DFPB 1, 2, 3 or 4.





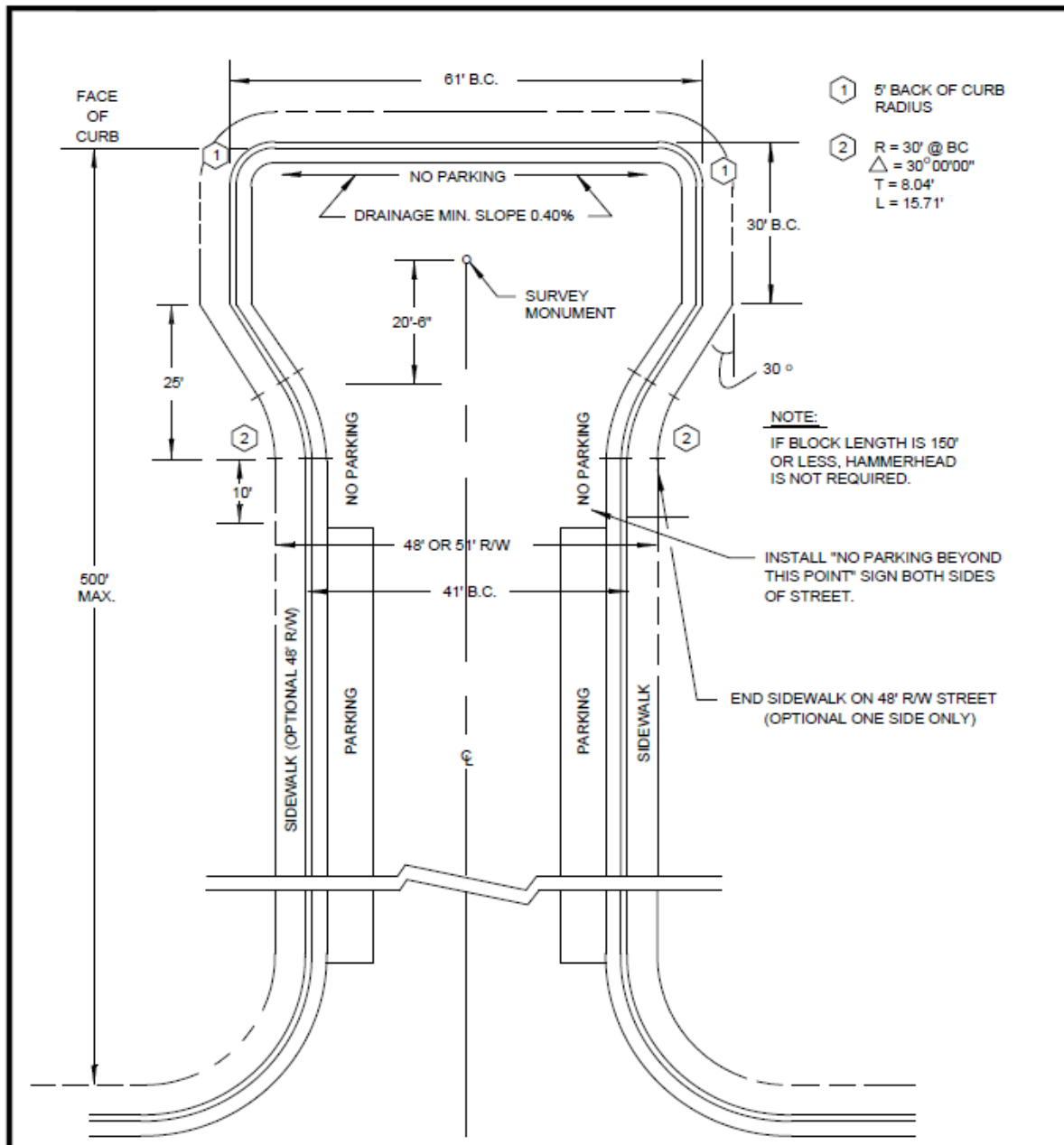
AGENCY APPROVED [B] [C] [H] [L] [M] [N]

SPECIFICATION REFERENCE

UNIFORM STANDARD DRAWINGS  
CLARK COUNTY AREA

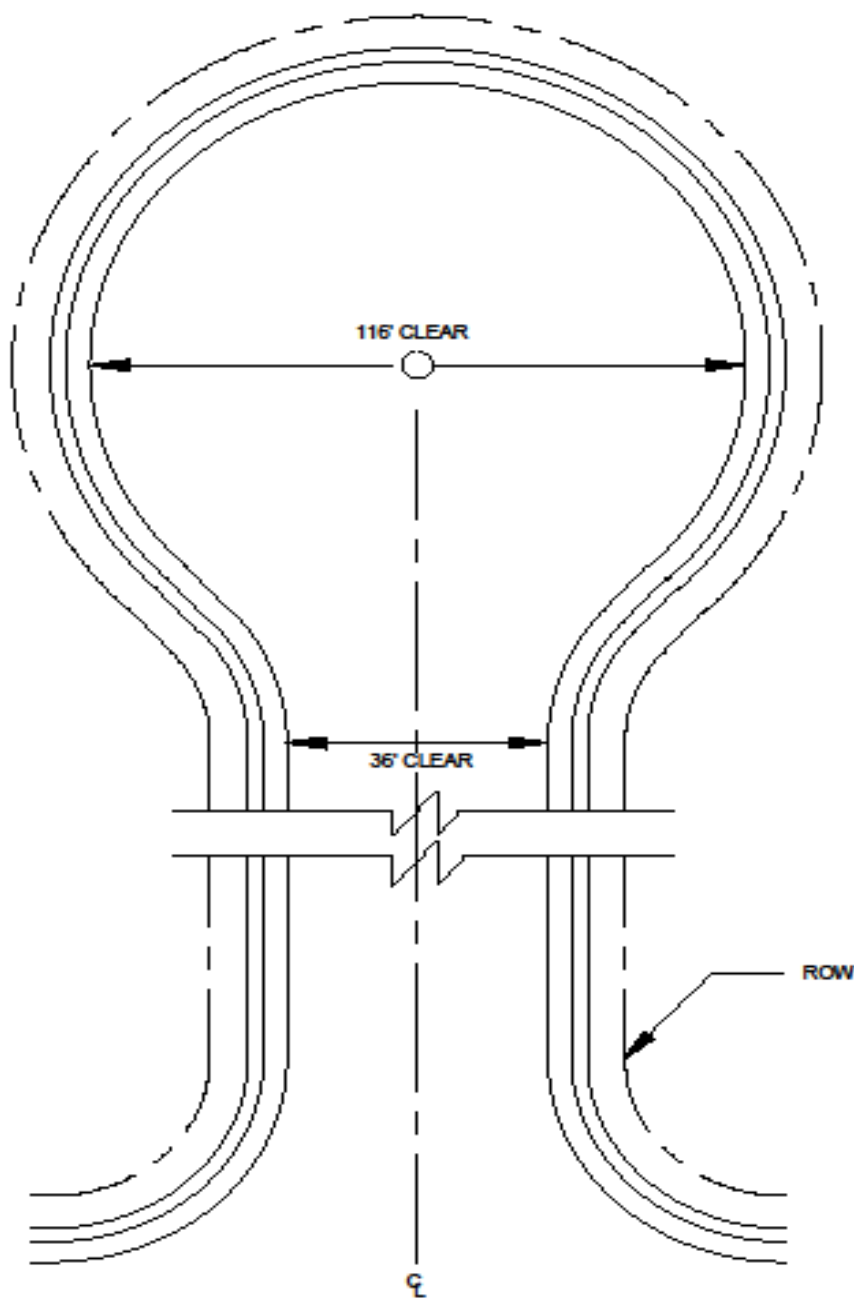
CUL-DE-SAC

DATE 6-8-00 DWG. NO. 212

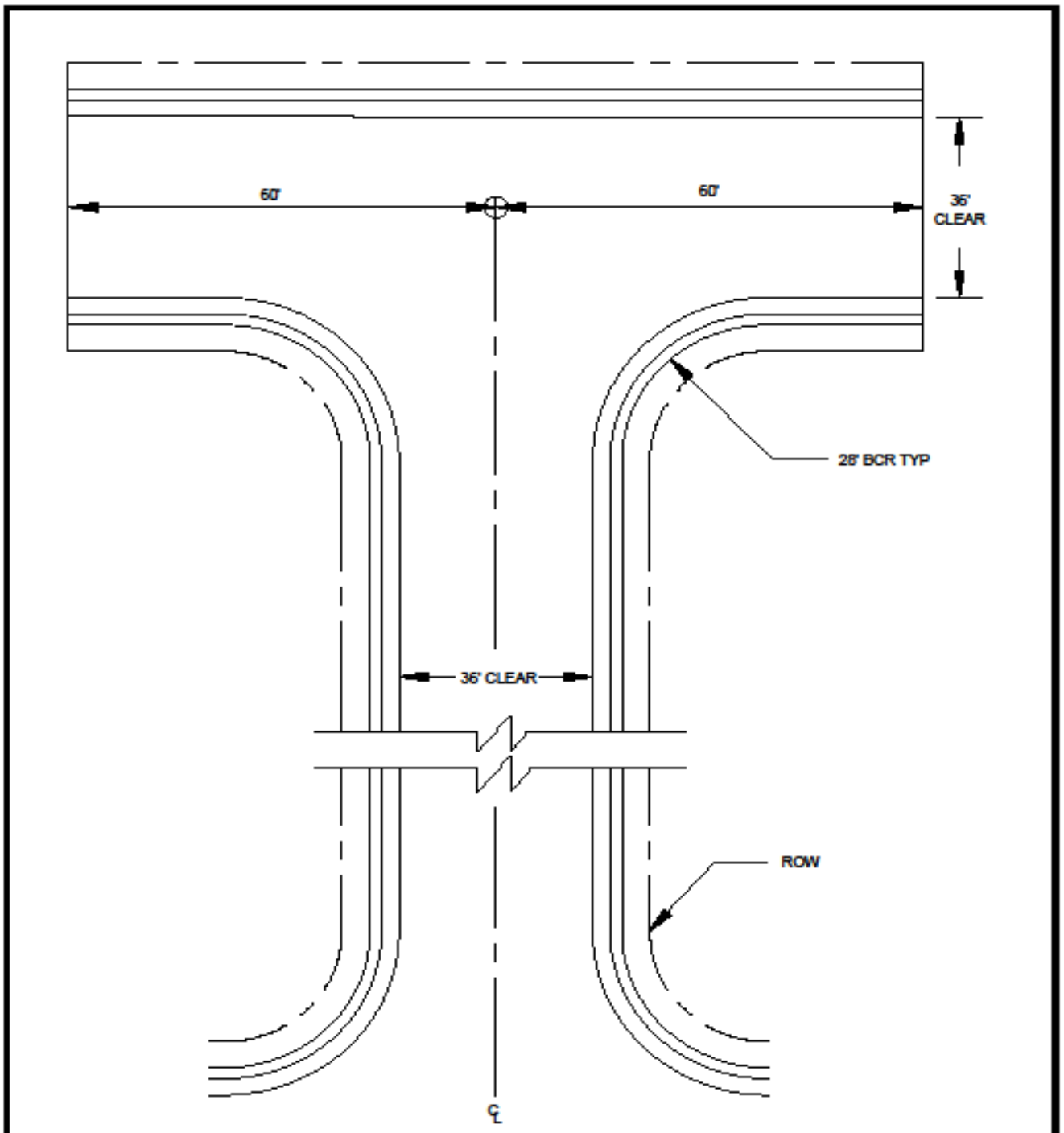


NOTE:  
USE OF THE HAMMERHEAD WILL BE ALLOWED IN SINGLE FAMILY RESIDENTIAL DWELLING AREAS ONLY.

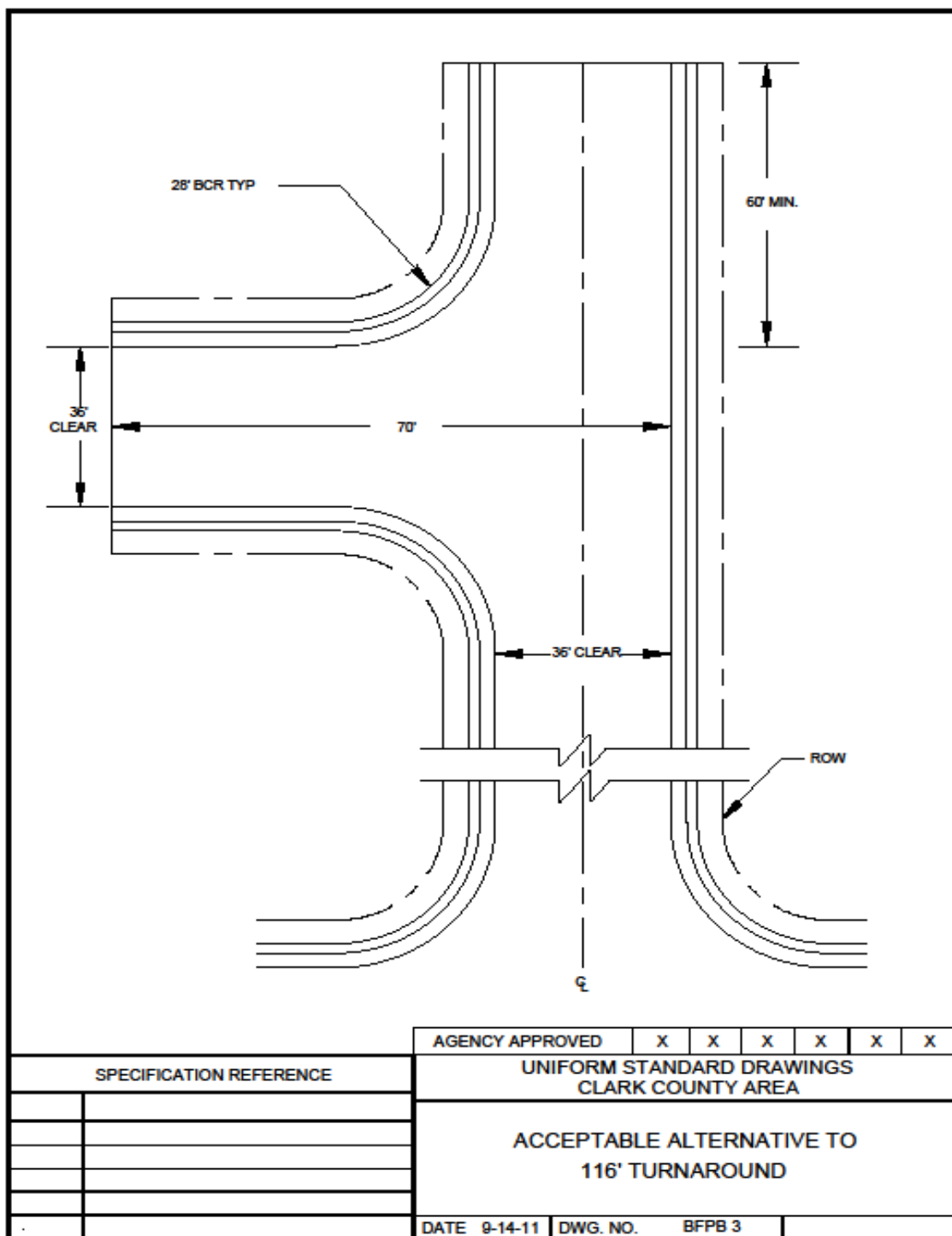
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SPECIFICATION REFERENCE	UNIFORM STANDARD DRAWINGS CLARK COUNTY AREA				
	SUPPLEMENTAL DRAWING				
	HAMMERHEAD				
	DATE 11-10-04	DWG. NO.	212.1.S1		

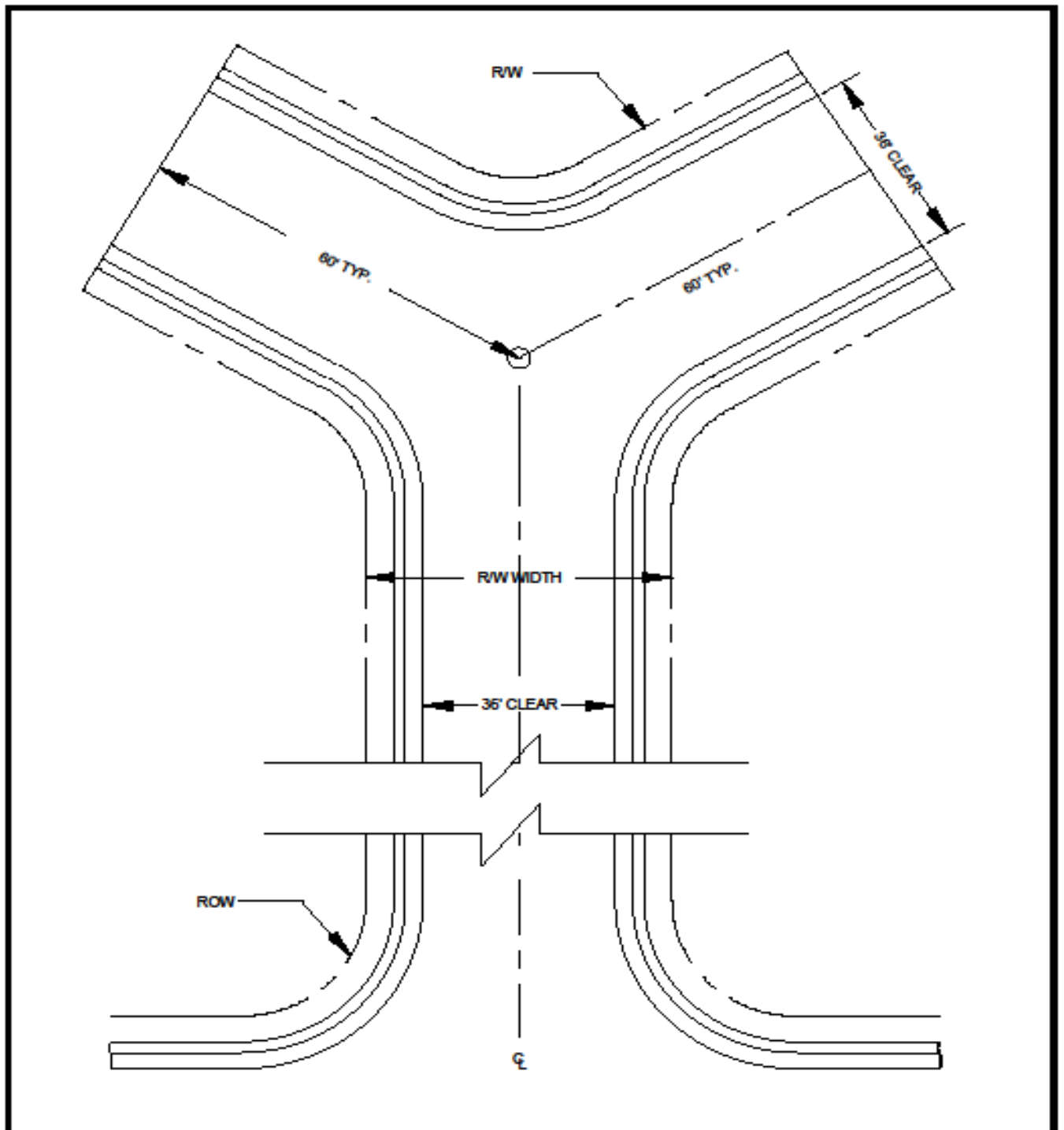


SPECIFICATION REFERENCE		AGENCY APPROVED					
		X	X	X	X	X	X
		UNIFORM STANDARD DRAWINGS CLARK COUNTY AREA					
		116' CUL-DE-SAC FOR CUL-DE-SACS EXCEEDING 500 FEET PER UDACS DWG NO. 212					
		DATE 9-14-11	DWG. NO.	DFPB 1			



AGENCY APPROVED		X	X	X	X	X	X
SPECIFICATION REFERENCE		UNIFORM STANDARD DRAWINGS CLARK COUNTY AREA					
		ACCEPTABLE ALTERNATIVE TO 116' TURNAROUND					
DATE	9-14-11	DWG. NO.	DFPB 2				





		AGENCY APPROVED	X	X	X	X	X	X
SPECIFICATION REFERENCE		UNIFORM STANDARD DRAWINGS CLARK COUNTY AREA						
		ACCEPTABLE ALTERNATIVE TO 116' TURNAROUND						
		DATE 9-14-11	DWG. NO.	DFPB 4				

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**Appendix O - SN**

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**Appendix O**  
**Proprietary Supervising Station Facilities****Section O101**  
**General**

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

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

**Section O102**  
**Site Requirements**

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

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

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

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

**Section O103**  
**Personnel**

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

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

**O103.2 Training.** Operators shall be trained on a yearly basis either by the installing fire alarm contractor, by the fire alarm maintenance contractor, or by the manufacturer's representative of installed fire alarm system. Documentation of annual training shall be kept on site and available upon request of the *fire code official*. Operators shall be trained on the following:

1. How to differentiate between a water flow alarm signal, a fire alarm signal, a fire supervisory signal, and a fire trouble signal.

2. The basic operations of the panel, including but not limited, to the following: signal acknowledgment, resetting of the fire alarm system, selection of evacuation zones, and activating of the evacuation, investigation (if applicable), and all-clear evacuation messaging.
3. The Standard Operating Procedures (SOP's) required by Section O104 for the facility.

**O103.3 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.

**O103.4 Coverage.** Adequate staffing shall be provided for runners to survey the entire facility within three minutes when responding to either a water flow alarm signal or a fire alarm signal.

#### **Section O104 Standard Operating Procedures**

**O104.1 General.** A Standard Operating Procedure (SOP) shall be submitted to the *fire code official* when applying for the required annual permit for proprietary supervising station facilities. The SOP shall outline procedures with regards to emergency procedures and the disposition of the alarm, supervisory, and trouble signals. The SOP shall include at a minimum the following items:

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

#### **Section O105 Disposition of Signals**

**O105.1 Alarm signals.** Upon receipt of a fire alarm signal, the proprietary supervising station operator shall immediately dispatch a runner to the alarm location identified on the fire alarm control unit.

- a. If the fire is verified, immediately activate the evacuation message on the fire alarm system and initiate notification procedures. See O103.4 for coverage requirements.
- b. If the alarm is false, the fire alarm system shall be reset. If either an investigation message or an evacuation message has been activated, then sound an all-clear message.

**O105.2 Supervisory signals.** Upon receipt of a supervisory signal, the proprietary supervising station operator shall immediately dispatch runner to the location identified on the fire alarm control unit, unless the supervisory conditions are promptly restored.

**O105.3 Trouble signals.** Upon receipt of trouble signals or other signals pertaining solely to matters of equipment maintenance of the fire alarm system, the proprietary supervising station operator shall immediately dispatch runner to the location identified on the fire alarm control unit, unless the trouble conditions are promptly restored.

#### **Section O106 Record-Keeping**

**O106.1 Alarms.** A written log of all fire alarm signals shall be maintained in the Fire Command Center including:

1. The investigating person's name.
2. The device address.
3. The type of alarm.



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

## Appendix P – SN/CC

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

#### Section P101 IMPAIRMENT PROCEDURES

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

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

The impairment coordinator is responsible for informing the Fire 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.

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

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

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

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

**P101.4.2 Fire watch.** When required by Tables P102.1 (a) and P102.1 (b) the impairment coordinator shall institute a fire watch within the building area where fire protection is impaired for the duration of the impairment. Fire watch shall be in accordance with the Fire Watch Guideline. Fire watch personnel shall be provided at a rate of

1 person per 100,000 square feet of building area, over the entire area of the building affected by the impairment. Fire watch personnel shall meet the following characteristics:

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

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

1. Fire 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.

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

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

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

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

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

Impairment Description	Building/ Location Height - Stories Above Grade	Impairment Duration	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
pools used as tanks) - without redundant water mains and tank acts as secondary supply only	2-5	> 10 hours	N	Y
		≤ 6 hours	N	N
	6 or more	> 6 hours	N	Y
		≤ 3 hours	N	N
Water storage tank (including pools used as tanks) - without redundant water mains and tank acts as break tank for primary supply	1	≤ 3 hours	Y	N
		> 3 hours	Y	Y
	2-5	≤ 2 hours	Y	N
		> 2 hours	Y	Y
	6 or more	≤ 1 hours	Y	N
		> 1 hours	Y	Y
Obstructions in water supply - Lack of Flushing/MIC	1	≤ 8 hours	N	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	N	N
		> 6 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y
Fire department access (fire hydrant, fire command center, fire pump and FDC access)	1	≤ 4 hours	N	N
		> 4 hours	Y	Y
	2-5	≤ 4 hours	N	N
		> 4 hours	Y	Y
	6 or more	≤ 4 hours	N	N
		> 4 hours	Y	Y

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

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

Impairment (Fire Alarms Systems, Groups A, E, H, I, R)	Building Height - Stories	Estimated Repair Time <sup>1</sup>	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
		> 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
		> 5 hours	Y	N
	6 or more	≤ 3 hours	Y	N
		> 3 hours	Y	Y
Single detection device not operational	1	≤ 10 hours	N	N
		> 10 hours	Y	N

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

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

<sup>1</sup> If the building is protected with a fire sprinkler system, the “Estimated Repair Time” hours shown in this column may be doubled.

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

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



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

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

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
	6 or more	≤ 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	
Clean-agent (without sprinkler system inside the space)	1	≤ 8 hours	Y	N
		> 8 hours	Y	Y
	2-5	≤ 6 hours	Y	N
		> 6 hours	Y	Y
6 or more	≤ 3 hours	Y	N	
	> 3 hours	Y	Y	
Water storage tank (including pools used as tanks) - with redundant water mains	1	≤ 10 hours	N	N
		> 10 hours	N	N
	2-5	≤ 10 hours	N	N
		> 10 hours	N	N
6 or more	≤ 8 hours	N	N	
	> 8 hours	N	Y	
Water storage tank (including	1	≤ 10 hours	N	N

Impairment (Water-Based Systems, Groups B, F, M and S)	Building/ Location Height – Stories Above Grade	Estimated Repair Time	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
pools used as tanks) - without redundant water mains and tank acts as secondary supply only	2-5	> 10 hours	N	Y
		≤ 6 hours	N	N
	6 or more	> 6 hours	N	Y
		≤ 3 hours	N	N
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 P103.1(b)**  
**FIRE ALARM SYSTEMS – USE GROUPS B, F, M, S**

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

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

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time <sup>1</sup>	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3
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
	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
> 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	1	≤ 5 hours	N	N

Impairment (Fire Alarm System, Groups B, F, M and S)	Building Height - Stories	Estimated Repair Time <sup>1</sup>	Fire Watch Req'd	Notify Dispatch and Fire Code Official for possible additional measures per section P101.4.3	
(automatic mode works)		> 5 hours	N	Y	
		≤ 5 hours	N	N	
	2-5	> 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	

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

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*Appendix Q - CC*

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**Appendix Q Southern Nevada Fire Chiefs Association Approved Guideline for Consumer Fireworks.****CONSUMER FIREWORKS****SCOPE:**

To provide for the issuance of permits for the sale and storage of fireworks classified as U.N. explosive class 1.4G “consumer fireworks” (formerly class C fireworks).

**REFERENCE:**

International Fire Code (IFC), Clark County Amendments to the IFC, NFPA 1124, Code for the Manufacture, Transportation, Storage, Retail Sales of Fireworks and Pyrotechnic Articles.

- The current Fire Code and / or amendments in effect for the specific jurisdiction.
- Testing procedures are labeled as Attachment #1 and are based on the requirements set forth in the APA (American Pyrotechnics Association) standard 87-1
  - This attachment is for the SNCFCC Only

**PURPOSE:**

To standardize Authority Having Jurisdiction requirements throughout Southern Nevada with all jurisdictions, regarding the issuance of permits for the sale, storage and use of U.N. explosive class 1.4G “consumer fireworks.”

**General Requirements**

This handout is a guideline provided as a public service and is not intended to be a reprint of every code section which addresses this issue. The user of this document is required to comply with all code requirements, laws, ordinances, etc., Authority Having Jurisdiction or otherwise which apply to the sales, storage and use of fireworks. The Authority Having Jurisdiction may require more stringent conditions than noted in this document.

- All product being used for retail sales, transporting, possess, store or manufactured must be through a Nevada State licensed, federally licensed and SNCFCC approved wholesaler.
  - A permit shall be obtained for the storage and sale of fireworks. The wholesaler shall submit an application for a storage site, and each retail site (fireworks retail sales stand / booth). Said application shall be made on a form supplied by the Authority Having Jurisdiction.
  - The Authority Having Jurisdiction shall review the permit packets and either approve or disapprove them within a reasonable time frame.
  - The issuance of a permit for the sale and storage of fireworks shall not preclude the Authority Having Jurisdiction from subsequently revoking the permit, imposing additional requirements, or supplementing any existing requirement whenever, in the opinion of the above, later information or newly discovered conditions justify such actions.
- A. Orientation Meeting for Wholesalers and Retailers
1. The Fire Prevention Division for each Authority Having Jurisdiction (or in combination) shall hold at least two (2) orientation meetings. These meetings shall be to review this Guideline and specific jurisdictional requirements and shall be before May 25<sup>th</sup> of each year. Each retailer shall attend at least one meeting for the specific jurisdiction where the retail sales stand / booth is to be located.
  2. Any representative can attend for all firework stands / booth locations for one organization. If there are more than 3 retail sales stand / booth per organization, 2 representatives shall attend the orientation and 1 person per every 3 retail sales stand / booth thereafter. Any representative can be available for the inspection of the

fireworks retail sales stand / booth on the day and time listed on the orientation form.

**B. Regulations for Fireworks**

1. Except as hereinafter provided, it shall be unlawful for any person to possess, store, offer for sale, expose for sale, sell at retail, or use or explode any consumer fireworks, provided that the Authority Having Jurisdiction shall have power to adopt reasonable rules and regulations for the granting of permits for supervised public display of fireworks by persons, corporations, associations, or other organizations.
2. The retail sale of fireworks shall only take place in fire department / fire code official authorized fireworks retail sales stand / booth by recognizable local charitable and not for profit organizations. A permit shall be obtained by the local AHJ.
3. No person, firm or corporation shall offer fireworks for sale to the public before the-1<sup>st</sup> day of July or after the 4<sup>th</sup> day of July each year.
4. The possession, storage, and use of approved consumer fireworks accepted by the SNCFCC and the Authority having Jurisdiction is permitted only from July 1<sup>st</sup> through July 4<sup>th</sup>.

**C. Permits**

1. To obtain an approval by the Authority Having Jurisdiction, the applicant shall:
  - a) Submit a completed application form.
  - b) Provide a site plan of the proposed location indicating all buildings, property lines, roadways, distances etc. Any deviation from the approved structure and/or site plan requires a submittal of the revised plan and must be approved.
    - An approved address is required.
  - c) Certificate of Insurance
    - The permittee / applicant shall furnish a certificate of insurance for at least \$1,000,000 or greater as specified by Authority Having Jurisdiction.
    - The insurance policy shall be for the payment of damages, which could be caused either to a person or persons or to property arising from acts of the permittee, agents, employees or subcontractors.
  - d) Provide proof of attendance at an orientation meeting.
  - e) Provide a copy of the contract for fireworks sales between the SNCFCC approved Wholesaler and the Retailers.
  - f) Provide a copy of the agreement / contract between the SNCFCC approved wholesalers and the land owner to allow a sales stand / booth on their property.
    - The address where the stand / booth will be located must be on the agreement / contract.
2. Revocation of Permits
  - a) The sale of fireworks is a privilege, which may be suspended or revoked by the Authority Having Jurisdiction when it is determined that any of the following occurred:
  - b) A permit is used by an organization other than the organization for which the permit was issued.
  - c) A permit is used for a location other than that for which it was issued.
  - d) Any of the conditions or limitations set forth in the permit have been violated.
  - e) The permittee fails, refuses, or neglects to comply with any order or notice duly served upon him or the organization under the provisions of jurisdictional requirements and / or this guideline within the time provided therein.
  - f) Fireworks are discovered to be stored at a location other than indicated on the application for permit.
  - g) The permittee sells any fireworks which were not obtained from a SNCFCC approved wholesaler.
  - h) Any fireworks specifically not on the approved list that are found on the premises (to include vehicles and trailers) are grounds for revocation of permit.



- i) Any violations discovered by local authorities that is against this guideline, local laws or local jurisdiction requirements.
- D. Fireworks retail sales stands / booths  
Wholesaler shall provide instruction / demonstration to the Retailers on the proper method of stand / booth setup prior to the fireworks retail sales stand / booth
1. Fireworks Stand / Booth Inspections:
    - a) Fireworks stands / booths shall be inspected and approved by the Authority Having Jurisdiction at any time starting July 1<sup>st</sup>.
    - b) The Authority Having Jurisdiction has the right to re-inspect any previously inspected and / or approved fireworks retail sales stands / booths at any time between July 1<sup>st</sup> and July 4<sup>th</sup>.
  2. Size of Stands / Booths
    - a) No fireworks retail sales stand / booth shall exceed 16 feet 6 inches in length or 8 feet in width.  
**Exception:** Any fireworks retail sales stand / booth exceeding these dimensions must be approved by the Authority Having Jurisdiction prior to construction.
  3. Construction of Stand / Booths
    - a) Siding and roof shall be made of ¼-inch or thicker plywood (or comparable material) or of Non-combustible materials. Converted travel-type trailers may be permitted. The fireworks retail sales stand / booth construction must be structurally sound.
    - b) Exiting for fireworks retail sales stand / booths shall comply with subsection “5” of this section.
    - c) All fireworks retail sales stand / booth used for sales of fireworks must be approved by the Authority Having Jurisdiction.
  4. Electrical Wiring and Appliances
    - a) All electrical wiring and appliances shall meet the requirements of the National Electrical Code.
    - b) Electrical wiring and lighting shall be “U.L.” listed for outside use when exposed to the elements.
    - c) Electrical wiring shall be properly sized for its use.
    - d) All electrical wiring shall be protected from physical injury.
    - e) Portable electric generator locations shall be at least 20 feet away from the stand / booth.
    - f) Minimum height of electrical wiring when placed from a utility pole or a building to the fireworks retail sales stand / booth is 13 feet 6 inches above grade.
  5. Exits
    - a) The fireworks retail sales stand / booth shall have no less than 2 exits (minimum of 6 feet in height and 2 feet in width).
    - b) The counter shall **not** be considered an exit.
    - c) Exit path shall be free and clear of all obstructions at all times.
    - d) Aisles: In temporary consumer fireworks retail sales stand / booths where the interior is not accessible to the public, the minimum clear width of the aisle shall be permitted to be not less than 28 inches.
  6. Location / Distances / Attachments
    - a) Tarps shall be allowed to be attached to the roof for protection from the elements.
      - Tarps shall be flame retardant and shall indicate this via certificate from the manufacture, on packaging (if indicated on packaging, the package shall remain with the tarp at all times) or on the tarp(s) itself.
      - Tarps shall be firmly secured in a manner that at no point shall any portion more than 1 foot of the tarp hangs over the edge of the roof edges of the stand / booth.
        - Tarp must not block the “No Smoking” symbol or signs
        - Type of tarps allowed to be used:

- o Tarps must be removed by organization at end of sale season
- o Method(s) for securing tarps allowed:
  - Attach tarp using a screw and washer through each grommet
    - Provides secure attachment to booth
    - A minimum 1inch screw shall be used to secure tarp.

b.) Fireworks retail sales stand / booths shall be so located as to not endanger persons, buildings, structures, property, brush, automotive vehicles and/or equipment, etc. Booths shall be located away from other hazards to include but not be limited to what is outlined in the following table:

	Minimum separation distances from fireworks retail sales stand / booth			
5 feet	10 feet	20 feet	30 feet	50 feet
Metal or aluminum pop up canopies	Vehicle Parking Curb or edge of roadway, street, or driveway, etc. Air / Water dispensers	Buildings Tents Fireworks Storage Other fireworks retail sales stand / booth Temp Generators and extra fuel Underground storage tank fuel fill ports	Combustibles (including empty product boxes, dry grass, dry brush and any combustible debris)	Motor vehicle fuel dispensers Propane dispensers Compressed natural gas dispensing facilities Aboveground storage tanks for flammable or combustible liquids, flammable compressed gasses including propane. Any cooking equipment (BBQ's) Ignition Sources (Matches, lighters etc.)

**Wholesaler Requirements**

**E. General Wholesaler Requirements**

Wholesalers shall obtain a permit from Authority Having Jurisdiction and/or other permits or licenses required for the possession and storage of fireworks prior to possession, storage, and/or transportation of fireworks.

The wholesaler shall ensure that each charitable or not for profit organization submits one completed permit application and required documents for a permit for each proposed fireworks retail sales stand / booth location. These forms can be submitted to the Authority Having Jurisdiction at any time, once they have attended the required orientation and prior to June 1st of the current sales year.

1. Permits shall at all times be kept on the storage premises and said premises shall at all times be subject to inspection by an officer of the fire or police department or other authorized persons.
2. Wholesalers are to inform the Authority Having Jurisdiction, in writing, by the 1st of May as to where they are proposing to store their products.
3. Wholesalers shall not permit fireworks from leaving storage yards until the first day of the authorized sales day (July 1<sup>st</sup>).

4. Wholesalers shall be required to present a copy of the guidelines and ensure the retailer understands the contents of the guideline; at time of application.
5. Wholesaler must inform the applicants of all requirements for sale of fireworks.

#### F. Certificate of Insurance

1. The wholesaler shall furnish a certificate of insurance at the time of permit submittal in the amount deemed adequate by the Authority Having Jurisdiction for the payment of damages which could be caused either to a person or persons or to property arising from acts of the permittee, agents, employees or subcontractors.
2. The permittee / wholesaler shall provide the name of the insurance company to furnish the policy at the time of the application. The amount of coverage shall be at least \$1,000,000 or greater as specified by Authority Having Jurisdiction public liability & property damage. The insurance policy shall designate the Authority Having Jurisdiction as an additional insured there under.

#### G. Testing and Acceptance of Fireworks

1. Testing and acceptance procedures are according to the SNCFCC Guideline for Consumer Fireworks Testing and Acceptance Procedure; attachment #1. This document is available upon request from the SNCFCC, Wholesaler or any local fire department's Fire Prevention Division.
  - a. Handhelds shall be tested every year and other materials / products (fountains, spinners, smoke balls etc.) shall be tested every 5 years.
  - b. All fireworks must be labeled with a permanently affixed Safe and Sane seal / label. (Stickers are not acceptable.)
  - c. Product must be packaged and labeled the way it is to be sold.
  - d. The testing of materials / products will be conducted / witnessed by Authority Having Jurisdiction SNCFCC members and shall be completed by April 30<sup>th</sup> of each sales year.

### **RETAILER REQUIREMENTS**

#### H. General Retailer Requirements

1. Retailers shall be limited to local charitable, fraternal, and non-profit organizations and shall obtain a permit from the Authority Having Jurisdiction through the approved wholesaler, for possession, storage, transportation, sales, and/or use of fireworks prior to storage or sale of fireworks.
2. A proof of orientation attendance certificate will be given to the fireworks retail sales stand / booth representative signed on the day of the orientation and will be required to be in a readily accessible location in the fireworks retail sales stand / booth prior to any permit being issued.
3. A copy of this guideline shall be at a readily accessible location in the fireworks retail sales stand / booth, and every worker in the booth shall have signed the signature sheet indicating that they have read and understand the guideline.
4. Retailers shall be permitted to sell approved consumer fireworks obtained from a SNCFCC approved Wholesaler.
5. Permits shall at all times be kept in the fireworks retail sales stand / booth and said premises and shall at all times be subject to inspection by an officer of the fire or police department or other authorized persons.

#### I. Fireworks Discharge

1. Fireworks shall not be ignited, discharged, or otherwise used within 300 feet of a consumer fireworks retail sales stand / booth or store, gasoline service station buildings, gasoline dispensers, flammable or combustible liquid tank fill or vent lines, above ground flammable or combustible liquid tanks or any building, structure or vehicle containing unsealed flammable or combustible liquids, hazardous materials, or explosives.
2. At least one sign that reads as follows, in letters at least 4in high on a contrasting background, shall be conspicuously posted on the exterior of each side of the consumer fireworks stand / booth. "No fireworks discharge within 300 feet"
3. Ignition of fireworks shall take place so as to not endanger persons, buildings, structures, property, brush, automotive vehicles and/or equipment, etc.

4. Ignition of fireworks shall not take place before the 1<sup>st</sup> day of July or after the 4<sup>th</sup> day of July.

#### J. Age and Number of Persons in the Fireworks Stand / Booth

1. No person under 16 years of age shall be allowed in a fireworks retail sales stand / booth
2. Booths must at all times have at least one adult and two people in the fireworks retail sales stand / booth at all times during operation. One of which must be 18 years or older.
  - a) Storing materials / products in fireworks retail sales stand / booths overnight require only one person to remain alert and awake at all times.
3. Limit the amount of people in the fireworks retail sales stand / booth to a max of 4 at one time.
  - a) Approx. 2 people per 8 feet panel / section of booth.
  - b) Bigger, approved custom booths will be addressed the same way

#### K. Conditions of Purchase

1. Consumer must be at least 16 years of age in order to purchase any type of fireworks.
2. Any person selling consumer fireworks shall not knowingly sell consumer fireworks to any person who is obviously under the influence of alcohol or drugs.

#### L. Training

1. All personnel handling consumer fireworks shall receive safety training related to the performance of their duties by the Wholesalers.

#### M. Fireworks Booths

1. Fire Protection
  - a) An approved minimum rated 2A10-B:C fire extinguisher(s)\* is required in each fireworks retail sales stand / booth. These are provided by the wholesaler when the Retailer picks up the product.
  - b) The extinguisher must be installed prior to stocking of product.
    - Must be mounted to wall of booth. 4 inch off floor up to 5 ft high
    - Must have current tag by a Nevada State Licensee\*
2. "NO SMOKING" Requirements
  - a) Smoking shall not be permitted inside or within 50 feet of the consumer fireworks retail sales stand / booth
  - b) "NO SMOKING" signs in English and Spanish shall be conspicuously and permanently posted on all 4 exterior sides of the fireworks retail sales stand / booth. The lettering shall be at least 3 inches in height, and be against a color contrasting surface so it can be easily seen.
  - c) The international symbol for "No Smoking" can be stenciled above the exit doors on the exterior of the fireworks retail sales stand / booth.
3. Display of Fireworks in Booths
  - a) Only fireworks obtained from a SNCFCC approved Wholesaler, which appear on the "approved" consumer fireworks product list of that calendar year as approved by the SNCFCC and/or the Authority Having Jurisdiction, shall be displayed in booths, for sale and on booth premises.
  - b) Extra product storage shall be neat and orderly under the shelving.
  - c) Matches, lighters and other sources of ignition shall not be located in the fireworks retail sales stand / booth or within 50 feet of booths.

#### N. Portable Generators

1. Portable generators shall be located not less than 20 feet from the consumer fireworks retail sales stand / booth.
2. Portable "gasoline" generators shall be permitted provided the fuel tank quantity is limited to 2 gallons. (*Class I flammable liquids*)
3. Portable "diesel or kerosene" generators shall be permitted provided the fuel tank quantity is limited to 5 gallons. (*Class II and Class III Combustible Liquids*)
4. Generator fuels shall not be stored less than 20 feet from the consumer fireworks retail sales stand / booth, and shall be limited to not more than 5 3 gallons.
5. Where the generator fuel storage is located greater than 50 feet from the consumer fireworks retail sales stand / booth, the quantity of such fuel shall not be limited.

O. Cooking Equipment

1. Cooking equipment of any type shall not be permitted within 50 feet of fireworks retail sales stand / booths, used for the storage or sale of consumer fireworks.

P. Parking

1. No motor vehicle or trailer parking within 10 feet of a fireworks retail sales stand / booth.
2. No motor vehicle or trailer carrying or storing consumer fireworks shall be parked within 20 feet of a fireworks stand / booth, except when delivering, loading, or unloading fireworks or other merchandise and materials used, stored or displayed for sale in the fireworks retail sales stand / booth.

Q. Security

1. Consumer fireworks retail sales stand / booth
  - a. Shall be manned at all times while product is on site for sale or storage.
  - b. Storing (not selling) materials / products in the fireworks retail sales stand / booths overnight require only one person to remain alert and awake at all times.
2. Storage Locations
  - a. There shall be no storage permitted at any location unless the location is approved for that use by the Authority having Jurisdiction.
  - b. In no case shall storage, for consumer fireworks, be permitted in residential neighborhoods, dwellings, garages, public ways or driveways.

R. Records

1. Inventory of Product
  - a. Available inventory records shall be maintained in the fireworks retail sales stand / booth when there is product on site.
  - b. The approved consumer fireworks product list shall be maintained in the fireworks retail sales stand / booth at all times when there is product on site.
  - c. Approved permit packet shall be maintained on site at all times when there is product on site.

## Attachment 1

(Of the Southern Nevada Fire Chiefs Association approved Guideline for Consumer Fireworks)  
Southern Nevada Consumer Fireworks Code Committee (SNCFCC)  
Testing and Acceptance Procedures

Based on the requirements set forth in the APA (American Pyrotechnics Association) Standard 87-1

## A. General

- a. It shall be unlawful for any person to possess, store, offer for sale, expose for sale, sell at wholesale or retail, or use or explode any fireworks.

*Exception:* Fireworks which meet all provisions of this rule and regulation and have been field-tested witnessed and accepted by the Southern Nevada Consumer Fireworks Code Committee.

- b. A minimum of 3 samples of each U. N. explosive class 1.4 G “consumer firework” devices due for renewal testing and new devices not previously tested and approved for sale by the SNCFCC shall be submitted to the SNCFCC for testing and acceptance no later than the 30<sup>th</sup> day of April of the current sales year. Items will be tested using the “Consumer Fireworks Product test Form”. Passed or failed based criteria is outlined below and on the form.
  - *Re-testing:* any item which fails the initial test may be submitted for retesting. A minimum of 10 samples are required for the retesting and shall be retested using the “Consumer Fireworks Product Test Form” The item will be passed or failed based on the criteria outlined below and on the form.
- c. The SNCFCC may revoke prior acceptance of any fireworks item due to the changing in any way of the item by the manufacturer, wholesaler, retailer, or any other person(s).
- d. Every five (5) years the SNCC shall test all fireworks and develop and “approved for sale” list
- e. Handheld devices shall be tested annually

## B. Safe and Sane Labels

- a. All locally accepted fireworks shall have a California State Fire Marshal’s “Safe and Sane” label printed on the item, or, in the case of small items, the item box shall have the State Fire Marshal’s “Safe and Sane Seal” on it. NO Safe and Sane “Stickers” will be allowed.
- b. Each and every fireworks item labeled “Safe and Sane” shall be approved by DOT as a UN explosive class 1.4G “consumer fireworks” and shall be on the SNCFCC or the Authority Having Jurisdictions approved for sale fireworks list.

## C. Packaging

- a. Retailers shall display and sell consumer fireworks as they are intended and required to be sold per the wholesaler.
- b. Pyrotechnic leakage
  - The pyrotechnic chamber in the firework device shall be sealed in a manner that prevents leakage of the pyrotechnic composition during handling, transportation and normal operations.

## D. Fuses

- a. Firework devices that require a fuse shall comply with the following:
  - Utilize only a safety fuse that has been treated or coated in such a manner as to reduce the possibility of side ignition.

*Exception:* Devices such as which require a restricted orifice to operate and contain less than 6 grams of pyrotechnic composition.

- Utilize only a fuse which will burn at least 3 seconds but not more than 9 seconds before ignition of the device.
- The fuse shall be securely attached so that it will support either the weight of the firework device plus 8 ounces (227g) of dead weight or double the weight of the device, whichever is less, without separation from the firework device for 30 seconds.

E. Bases

- a. The base of the bottom of the firework devices that are operated in a standing position shall have the minimum horizontal dimension or the diameter of the base equal to at least  $\frac{1}{3}$  of the height of the device including any base or cap affixed thereto. Bases must remain fully attached to the item during transportation, handling and normal operations.

F. Handles

- a. Firework devices which are intended to be hand-held and so labeled shall incorporate a handle at least 4 inches in length. Handles shall remain firmly attached during transportation, handling and full operation of the device, or shall consist of an integral section of the device at least 4 inches below the pyrotechnic chamber.

*Exception:* Sparklers which are less than or equal to 10 inches in length shall have the handles greater than or equal to 3 inches in length.

G. Spikes

- a. Spikes provided with fireworks devices shall be firmly attached during transportation, handling and full operation of the device. Spikes shall protrude at least 2 inches from the base of the device and shall have a blunt tip not less than  $\frac{1}{8}$  inch in diameter or  $\frac{1}{8}$  inch square.

H. Ground Spinners

- a. Ground spinning devices or any device that is designed to move shall operate within an area of a circle of 10 feet in diameter or less.
- b. The device shall not rise more than 1 foot into the air.
- c. Multi-color or multi-effect ground devices shall not exceed 10 seconds between effects.

I. Wheeled Devices

- a. Drives in firework devices commonly known as "wheels" shall be securely attached to the device so that they will not come loose in transportation, handling, and normal operation. Wheel devices intend to operate in a fixed location shall be designed in such a manner that the axle remains attached to the device during normal operation.
- b. A nail for attachment to a suitable location shall be included with each device.

J. Toy Smoke and Flitter Devices

- a. Toy smoke devices shall be constructed so that they will neither burst nor produce external flame (excluding the fuse and first fire upon ignition) during normal operation.
- b. Toy smoke and flitter devices shall not be of such color and configuration so as to be confused with banned fireworks including but not limited to: M-80 salutes, silver salutes, cherry bombs, etc.
- c. Toy smoke devices shall not incorporate plastic as an exterior material if the pyrotechnic composition comes in direct contact with the plastic.

K. Ignition testing

- a. Burnout, blowout and meltdown

- Burnout – the unintended escape of flame through the wall of a pyrotechnic chamber during use
- Blowout – the unintended release of pressure at the other than the intended orifice
- Meltdown – the continued burning of a pyrotechnic device after the intended effect has concluded. (Cool down time: 30 minutes per AFSL requirements)

b. Residual Burning Test

- Use a thermal detector to note the temperature on the test form during ignition. Place the detector 11 inches from top of product while getting temperature reading.
- After the 30 min cool down period, note the temperature on the test form holding the detector 11 inches from top of product.
  - If the internal temperature of the product tested is above 250 °F (121 °C), the product is recorded as a failure

c. Duds

- Duds – devices which fail to ignite and perform their intended effect, or which the fuse initially ignites but fails to ignite the device.

L. Novelties

- a. Novelties are defined as U.N. class 1.4s or are deregulated and NOT classified as hazardous materials by DOT on the basis of specific test results. Novelty items are not tested or approved by SNCC and are legal to sell year round.
- Novelties Include:
    - **Party Poppers** – Small plastic or paper devices containing not more than 16 mg of explosive composition that is friction sensitive. A string protruding from the device is usually pulled to ignite it. This device expels non-flammable paper streamers and/or similar products and produces a small report.
    - **Snappers** – Small, paper-wrapped device containing not more than 1.0mg of explosive composition coated on small bits of sand, and package with sawdust in individual containers of not more than 50 units. When dropped the device explodes, producing a small report.
    - **Snake, Glow Worm** – Pressed pellet of not more than 2g of pyrotechnic composition and packaged in retail packages of not more than 25 units that produces as the primary effect a snake-like ash upon burning. The ash expands in length as the pellet burns.
    - **Sparklers (#10 or less)** – Wire or stick coated with pyrotechnic composition which may not exceed 100 g per item, that produces a shower of sparks upon ignition.
    - **Toy Caps** – Toy plastic or paper caps for toy pistols in sheets, strips, rolls, or individual caps, containing not more than an average of 16 mg of explosive composition per cap. Toy Caps are described as fireworks UN0336 and classed as 1.4G.
    - **Other Novelties** – Devices intended to produce unique visual or audible effects and containing 50mg or less of explosive composition and limited amounts of other pyrotechnic composition. *Examples include:* Cigarette loads, trick matches, explosive auto alarms and other trick noise makers.

M. Prohibited Chemicals

- a. Firework devices shall not contain any of the following:
- Arsenic sulfide, arsenates, or arsenite.
  - Boron
  - Chlorates



- *Exceptions:*
  - a. In colored smoke mixtures to which an equal or greater amount of sodium bicarbonate is included.
  - b. In caps
  - c. In those small items wherein the total power content does not exceed 4g of which not greater than 15% (or 600mg) is potassium, sodium, or barium chloride.
- Gallate or gallic acid
- Magnesium
  - *Exception:*
    - a. *Magnesium / aluminum alloys, aka "magnalium"*
- Mercury salts
- Phosphorus (red or white)
  - *Exception:*
    - a. Red phosphorus is permitted in caps
- Picrates or picric acid
- Thiocyanates
- Titanium
  - *Exception:*
    - a. Particle sizes greater than 100-mesh
- Zirconium

## Consumer Fireworks Product Test Sheet

**Distributor:** TNT  Phantom  Other: \_\_\_\_\_

**Full Product Name:** \_\_\_\_\_ Single Color  Multiple Colors

**Item #:** \_\_\_\_\_ **EX #:** \_\_\_\_\_ **If Packaged in multiples, # per package:** \_\_\_\_\_

**Type:** Fountain  Spinner  Sparkler  Popper  Snake  Handheld

**New:**  **Renewal:**  **Re-test:**

**Initial Test Weight:** 1: \_\_\_\_\_ 2: \_\_\_\_\_ 3: \_\_\_\_\_

**Re-test Weight:** 1: \_\_\_\_\_ 2: \_\_\_\_\_ 3: \_\_\_\_\_ 4: \_\_\_\_\_ 5: \_\_\_\_\_ 6: \_\_\_\_\_

7: \_\_\_\_\_ 8: \_\_\_\_\_ 9: \_\_\_\_\_ 10: \_\_\_\_\_

**Packaging:** N/A  **Pass** **Fail**

Safe & Sane label: \_\_\_\_\_  
Leakage: \_\_\_\_\_  
Fuse attached: \_\_\_\_\_

**Base:** N/A  **Pass** **Fail**

Firmly attached: \_\_\_\_\_  
More or equal to 1/3 of height: \_\_\_\_\_

**Handles:** N/A  **Pass** **Fail**

Firmly attached: \_\_\_\_\_  
At least 4" in length: \_\_\_\_\_

**Spinners:** N/A  **Pass** **Fail**

Within 10" diameter circle: \_\_\_\_\_

**Ignition Testing:** N/A  **Pass** **Fail**

Fuses ignite time (3-9sec): \_\_\_\_\_  
Visible burn out: \_\_\_\_\_  
Visible blow out: \_\_\_\_\_  
Remained stationary & upright: \_\_\_\_\_

**Joy Smoke:** N/A  **Pass** **Fail**

Color & configuration not  
confused w/ m-80: \_\_\_\_\_  
Any plastic in contact w/ product  
combustion: \_\_\_\_\_

**Recorded Heat Temperature:** During ignition \_\_\_\_\_ After cool down (30 min) \_\_\_\_\_

**Notes:**

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**Distributor Initials:** \_\_\_\_\_

**Pass:**

**Fail:**

**Inspector Initials:** \_\_\_\_\_

**Fail-Need Retest:**

**Date:** \_\_\_/\_\_\_/\_\_\_

**Re-test Failed:**

**Re-test Passed**

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# NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

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## NFPA 13

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### 3.3.16 - SN

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

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### 5.3.2.1 - SN

**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.

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### 6.1.3 - SN

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

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### 6.2.9.7.1 - SN

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

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

**6.3.1.1.2 - SN**

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**6.3.1.1.2** Pipe or tube shall have a minimum Corrosion Resistant Ratio (CRR) of 1.

**7.1.3 - SN**

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**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.

**7.2.3.1 - SN**

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**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.

**7.2.3.3 - SN**

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**Delete Section 7.2.3.3**

**7.2.3.4 - SN**

---

**Delete Section 7.2.3.4**

**7.2.3.5 - SN**

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**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.

**7.2.6.3 - SN**

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**7.2.6.3 Air Supply**

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

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

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

**7.2.6.6.5 - SN**

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**7.2.6.6.5** A high/low pressure supervisory signal to a constantly attended location shall be installed.

**7.3.2.3.1.3 - SN**

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**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.

**7.6.2.3 - SN**

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**7.6.2.3** An antifreeze solution shall be prepared with a freezing point at or below 2° F (-16.7° C)

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### 7.9.2.2 - SN

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#### Delete Section 7.9.2.2

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### 7.9.3.1 - SN

**7.9.3.1** Unless the requirements of 7.9.3.2 or 7.9.3.4 are met, exhaust ducts shall have one sprinkler or automatic spray nozzle located at the top of each vertical riser, 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.

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### 7.9.9 - SN

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

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### 8.2.4 (8.2.4.3 is deleted) - SN

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#### 8.2.4 Floor Control Valve Assemblies.

**8.2.4.1\*** 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.

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

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### 8.2.5 - SN

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

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### 8.3.3.1 - SN

**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 3.6.4.8
- (2) Residential sprinklers in accordance with the requirements of 8.4.5
- (3) Quick response CMSA sprinklers
- (4) ESFR sprinklers
- (5) Standard response sprinklers used for modifications or additions, within the existing compartment, to existing systems equipped with standard response sprinklers
- (6) Standard response sprinklers used where individual standard response sprinklers are replaced in existing systems

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### 8.7.5.3.2 - SN

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

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

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**8.8.5.3.2 - SN**

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

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

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**8.9.5.3.2 - SN**

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

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

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**8.15.1.2.10 - SN**

**Delete Section 8.15.1.2.10**

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**8.15.1.2.11 - SN**

**Delete Section 8.15.1.2.11**

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**8.15.4.1 - SN**

**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

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**8.15.7.1 - SN**

**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

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**8.15.7.2 - SN**

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

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**8.15.7.3 - SN**

**Delete Section 8.15.7.3**

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**8.15.8.1.1 - SN**

**8.15.8.1.1** Sprinkler protection shall be provided in all bathrooms.

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**8.15.8.1.1.1 - SN**

**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<sup>2</sup> (5.1 m<sup>2</sup>). Such rooms shall be surrounded by walls and doors that completely enclose the room.

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**8.15.8.2 - SN**

**8.15.8.2 Closets and Pantries.** Sprinklers protection shall be provided in clothes closets, linen closets, and pantries.

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**8.15.11.1 - SN**

**8.15.11.1** Sprinkler protection shall be required in electrical equipment rooms.

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**8.15.11.2 - SN**

**Delete Section 8.15.11.2**

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**8.15.15.1 - SN**

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

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**8.15.15.2 - SN**

**Delete Section 8.15.15.2**

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**8.15.15.3 - SN**

**Delete Section 8.15.15.3**

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**8.15.15.4 - SN**

**Delete Section 8.15.15.4**

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**8.15.15.5 - SN**

**Delete Section 8.15.15.5**

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**8.15.20.1.1 - SN**

**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.

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**8.15.20.1.2 - SN**

**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<sup>2</sup> (4.6 m<sup>2</sup>). The sprinklers shall have a k-factor equal to the k-factor of existing upright sprinklers.

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**8.15.20.1.3 - SN**

**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.

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**8.15.20.1.4 - SN**

**8.15.20.1.4** Flexible sprinkler hose drops shall be proven by hydraulic calculations.

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**8.15.27- SN**

**8.15.27 Temporary Exhibit Booths Within a Permanent Building.** Where sprinkler protection is required in temporary exhibit booths constructed in a permanent building, such systems shall comply with Section 8.15.27.

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

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

**8.15.27.3 Hangers.** Hangers conforming to Section 9.1 shall be provided for temporary piping to temporary exhibit booths. Hangers shall be permitted to be attached to the temporary exhibit booth structure.

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

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

#### 8.15.28 - CC

**8.15.28 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 a separate sprinkler system, and shall be controlled, monitored, and supplied independently of the overhead system(s)

#### 8.16.1.1.2.1 - SN

**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

#### 8.16.1.1.2.3 - SN

**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.

#### 8.16.1.2.5 - SN

**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.

#### 8.16.4.1.4 - CC

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

#### 8.16.4.1.4.1 - CC

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



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#### 8.16.4.1.4.2 - CC

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

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#### 8.16.4.1.5.1 - SN

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

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#### 8.17.1.1 - SN

**8.17.1.1. Local Waterflow Alarms Units.** A local waterflow alarm unit shall be provided on every sprinkler system. Such waterflow alarm units shall be installed in accordance with 6.8.

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#### 8.17.2.4.1.3 - SN

**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.

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#### 9.1.3.9.3 - SN

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

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#### 9.1.3.9.4 - SN

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

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#### 9.2.1.3.3.5 - SN

**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.

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#### 9.3.5.9.3.1 - SN

**9.3.5.9.3.1** The value of  $S_s$  used in Table 9.3.5.9.3 shall be 0.95 from seismic hazard maps.

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#### 9.3.6.7 - SN

**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*.

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### 10.1.2 - SN/CC

**10.1.2\*** All piping used in private fire service mains shall be rated for the maximum system working pressure to which the piping is 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 pump or a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 305), or 50 psi greater than the FDC design pressure, whichever is greater.

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### 10.2.2 - SN/CC

**10.2.2** All fittings used in private fire service mains shall be rated for the maximum system working pressure to which the fittings are exposed, but shall not be rated at less than 150 psi (10 bar). When the underground piping can be supplied or pressurized by a fire pump or a Fire Department Connection (FDC), the underground piping shall be designed to withstand a working pressure of not less than 200 psi (Class 305), or 50 psi greater than the FDC design pressure, whichever is greater.

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### 11.3.1.1 - CC

**11.3.1.1** The design area shall be in accordance with either 11.2.3.2 or 11.2.3.3.

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### 11.3.3.3 - SN

**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.

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### 11.3.6 - SN

#### **11.3.6 NONSTORAGE OCCUPANCIES WITH HIGH CEILINGS**

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

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

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

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

## 11.3.7 - SN

**11.3.7 SPRINKLER PROTECTION FOR EXHIBITION SPACES AND STAGES WITH FLY GALLERIES**

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

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

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

## 22.15.2.2.1.3.1 - SN

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

## 22.38 - SN

**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.

Building Area SIZE RANGE <sup>6</sup>	PROTECTION RESIDENTIAL SYSTEM TYPE <sup>1,3</sup>	SEPARATE SPRINKLER LEAD-IN REQUIRED <sup>5</sup>	MINIMUM UNDERGROUND PIPE SIZE <sup>5</sup>	MINIMUM WATER SIZE <sup>7</sup>	METER	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
<3,600 sq ft	Standard NFPA 13D <sup>2</sup>	See NFPA 13D for design requirements.				
≥3,600 sq ft & <10,000 sq ft	Enhanced NFPA 13D <sup>1,2</sup>	See NFPA 13D for design requirements				
≥10,000 sq ft & <15,000 sq ft	Enhanced NFPA 13R <sup>1</sup>	See NFPA 13R for design requirements				
≥ 15,000 sq ft	Modified NFPA 13 <sup>1</sup>	Yes	N/A	N/A	Yes	Yes

N/A = Not Applicable

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

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

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

- e. Unconditioned spaces such as storage rooms or exterior accessible spaces that are subject to freezing.

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

#### 23.1.3.1 - CC

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**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 °F 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.

#### 23.4.1.7 - SN

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

#### 23.4.1.8 - SN

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

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#### 24.2.1.11 - CC

**24.2.1.11** 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

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#### 25.5.1 - SN

**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.

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#### 25.6.1.1 - SN

**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.

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#### 25.6.1.2 - SN

**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.

### NFPA 13D

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#### 4.2.3 - CC

**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.

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#### 4.5 - SN

##### 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.

#### 6.2.3.1 - SN

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

#### 6.3.1 - SN

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

#### 6.5 - SN

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

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

**6.5.2** In common water supply connections serving more than one dwelling unit, 5 gpm (20 L/min) shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply



requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler.

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

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

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

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

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

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

## 6.6 - SN

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

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

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

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

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

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

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



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

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

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

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

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#### 7.1.1 - SN

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

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#### 7.1.2 - SN

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

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#### 7.5.6.1.1 - SN

**7.5.6.1.1** Temperature ratings for sprinklers stored or installed in unconditioned environments where the maximum ambient temperature exceeds 100<sup>0</sup> F (38<sup>0</sup> C) shall comply with 7.5.6.2.

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#### 7.7 - SN

##### **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.

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#### 8.1.3.1.2 - SN

**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.

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#### 8.3.4.1 - SN

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

## 8.4 - SN

**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<sup>4</sup>**

<b>Building Area SIZE RANGE <sup>6</sup></b>	<b>Mitigation Residential SYSTEM TYPE<sup>1,3</sup></b>	<b>SEPARATE SPRINKLER LEAD-IN REQUIRED <sup>5</sup></b>	<b>MINIMUM UNDERGROUND PIPE SIZE <sup>5</sup></b>	<b>MINIMUM WATER METER SIZE<sup>7</sup></b>	<b>SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.</b>
< 3,600 sq.ft.	Standard NFPA 13D <sup>2</sup>	No	1"	¾"	No
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D <sup>1,2</sup>	No	1"	¾"	No
> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R <sup>1</sup>	See NFPA 13R for design requirements			
>15,000 sq.ft.	Modified NFPA 13 <sup>1</sup>	See NFPA 13 for design requirements			

N/A = Not Applicable

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

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

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

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

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### 12.1 - SN

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

## NFPA 13R

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### 1.1 - SN

#### 1.1 Scope

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

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#### 5.1.3 - SN

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

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#### 5.2.2 - CC

**5.2.2** Pipe or tube used in sprinkler systems shall be of the materials specified in Table 5.2.2 or shall be in accordance with 5.2.3. Piping shall have corrosion resistance ratio (CRR) of 1 or more.

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#### 6.4.4 - SN

**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.

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#### 6.6.4 - SN

**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.

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#### 6.6.7 - SN

**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.

**6.7.2.2.1 - CC**

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

**6.7.2.2.1.1 - CC**

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

**6.7.2.2.2 - CC**

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

**6.7.2.2.3 - SN**

**Delete Section 6.7.2.2.3**

**6.7.2.3.2 - SN**

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

**6.8.2 - SN**

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

**6.15 - SN**

**Delete Section 6.15**

**7.5 - SN**

**7.5 Protection Matrix for Group R Division 3 Occupancies.** When a sprinkler system is being installed to mitigate the minimum Fire Code requirements for fire flow, number of fire hydrants, or fire department access, the design requirements in Table 7.5 shall be applied.

Table 7.5 Protection Matrix for Group R Division 3 Occupancies and Building Built Under the IRC <sup>4</sup>						
Building Area SIZE RANGE <sup>6</sup>	Mitigation Residential SYSTEM TYPE <sup>1,3</sup>	SEPARATE SPRINKLER LEAD-IN REQUIRED <sup>5</sup>	MINIMUM UNDERGROUND PIPE SIZE <sup>5</sup>	MINIMUM WATER SIZE <sup>5</sup>	METER	SPRINKLERS REQUIRED IN AREAS SUBJECT TO FREEZING.
< 3,600 sq.ft.	Standard NFPA 13D <sup>2</sup>	See NFPA 13D for design requirements				
> 3,600 sq.ft. and < 10,000 sq.ft.	Enhanced NFPA 13D <sup>1,2</sup>	See NFPA 13D for design requirements				

> 10,000 sq.ft. and < 15,000 sq.ft.	Enhanced NFPA 13R <sup>1</sup>	Yes	N/A	N/A	Yes
> 15,000 sq.ft.	Modified NFPA 13 <sup>1</sup>	See NFPA 13 for design requirements			

N/A = Not Applicable

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

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

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

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

### 8.1.7 - SN

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

- (1) Project name/name of owner and occupant
- (2) Location, including street address
- (3) Point of compass
- (4) Ceiling construction
- (5) Full height cross-section or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping
- (6) Ceiling/roof heights and slopes not shown in the full height cross section
- (7) Location of partitions and fire walls, including lintels and doorways. Lintel openings require a cross section view to indicate the area of the opening
- (8) Location and size of concealed spaces, attics, closets, and bathrooms
- (9) Any small enclosures in which no sprinklers are to be installed
- (10) Size of city main in street and the city main test results including elevation of the test hydrant. Indicate whether dead end or circulating, and, if dead end, the direction and distance to nearest circulating main
- (11) Make, manufacturer, model, type, temperature rating, sprinkler identification number, nominal K-factor and orifice size of the sprinkler, and the quantity of each sprinkler installed
- (12) Type and location of high-temperature sprinklers
- (13) Number of sprinkler on each riser, per floor

- (14) Type and location of horn/strobes
- (15) Type of pipe and fittings
- (16) Pipe type and schedule of wall thickness
- (17) Type of protection for nonmetallic pipe
- (18) Location and size of riser nipples
- (19) Type of fittings and joints and the location of all welds and bends
- (20) Type and locations of hangers, sleeves, braces, and methods of securing sprinklers, where applicable
- (21) All control valves, check valves, drain pipes, and test connections
- (22) Underground pipe size, length, location, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade.
- (23) Name, address, phone number, and contractor's license number of sprinkler contractor
- (24) Nominal pipe size with lengths shown to scale
- (25) Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
- (26) A graphic representation of the scale used on all plans
- (27) Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets
- (28) The minimum rate of water application and the design area of water application
- (29) The total quantity of water and the pressure required noted at a common reference point for each system. For hydraulically designed systems, the information on the hydraulic data nameplate
- (30) Relative elevations of sprinklers, junction points, and supply or reference points
- (31) Information about backflow preventers (manufacturer, size, type)
- (32) Information about antifreeze solution used (type and amount)
- (33) Size and location of hydrants, showing size and number of outlets; static and residual hydrants that were used in flow tests or models shall be shown
- (34) Size, location, and piping arrangement of fire department connections
- (35) Location of fuel-fired equipment and heating and air-conditioning equipment
- (36) Locations of closets on exterior balconies, and any doors or penetration between the closet and the dwelling unit
- (37) Edition year of NFPA 13R to which the sprinkler system is designed
- (38) Occupancy, label, and name for each area or room
- (39) Make, type, model, and size of alarm or dry pipe valve
- (40) Approximate capacity in gallons of each dry pipe system
- (41) Nevada State Fire Marshal registration number
- (42) Signature and NICET number, or engineer's seal, of the designer
- (43) General notes as required by the AHJ

#### 10.2.2.3 - CC

**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.

#### NFPA 14

#### 4.2.3.2 - SN

**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.

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#### 4.6.1.1.1 - SN

**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.

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#### 4.8.2 - SN

**4.8.2** Unless the requirements of 4.8.2.1 or 4.8.2.2 are met, the fire department connection shall have at least two 2 ½ inch (65 mm) internal threaded fittings having NHS threads, as specified in NFPA 1963. Fire Department Connections shall be provided with internal check valve(s) such that water being supplied into any inlet will not flow back out of any other inlet. For the purposes of this section, internal clapper valve devices provided by the manufacturer in listed Fire Department Connections shall be considered internal check valves. (See Section 7.7 and 7.12 for design requirements)

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#### 6.3.2.1 - SN

**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.

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#### 6.3.7.1 - SN

**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

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#### 6.4.5.3.1 - SN

**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.

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#### 7.2.3.2 - SN

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

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#### 7.2.3.4 - SN

**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.

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#### 7.2.4 - SN

**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 components.
  - (9) Remote monitoring and supervision for detecting high pressure failure of the pressure-regulating device shall be provided in accordance with *NFPA 72*.
  - (10) A drain sufficient to allow flow of the full anticipated system flow shall be provided adjacent to the pressure-regulating devices. Use of this drain line for discharge from the pressure relief valve shall be permitted.

#### 7.3.2.10 - SN

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

#### 7.3.2.11 - SN

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

#### 7.3.3.1 - SN

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

#### 7.4 - SN

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

#### 7.8.1 - SN

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**7.8.1 Minimum Design Pressure for Hydraulically Designed Systems.** Hydraulically designed standpipe systems shall be designed to provide the waterflow rate required by Section 7.10 at a minimum residual pressure of 125 psi



(8.6 bar) at the outlet of the hydraulically most remote 2 ½ in. (65 mm) hose connection and 65 psi (4.5 bar) at the outlet of the hydraulically most remote 1 ½ in. (40 mm) hose station.

#### 7.8.1.2 - SN

**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.

#### 7.11.1.1.1 - SN

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

#### 8.1.2 - SN

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

- (1) Name of owner(s) and occupant(s)
- (2) Location, including street address
- (3) Point of Compass
- (4) Name, address, phone number, and contractor's license number of installing contractor
- (5) For automatic and semiautomatic standpipe systems, the following:
  - (a) Size of city main in street and whether dead end or circulating; if dead end, direction and distance to nearest circulating main
  - (b) City main test results and system elevation relative to test hydrant
- (6) For automatic and semiautomatic standpipe systems, other sources of water supply, with pressure and elevation including water storage tanks and fire department connections
- (7) Approximate capacity of each dry system
- (8) For automatic and semiautomatic standpipe systems, water supply capacity information, including the following:
  - (a) Location and elevation of static and residual test gauge with relation to the riser reference point
  - (b) Flow location
  - (c) Static pressure [psi (bar)]
  - (d) Residual pressure [psi (bar)]
  - (e) Flow [gpm (L/min)]
  - (f) Date
  - (g) Time
  - (h) Name of person who conducted the test or supplied the information
  - (i) Other sources of water supply, with pressure or elevation
- (9) Pipe type and schedule of wall thickness
- (10) Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions)
- (11) Manufacturer and type of fittings and joints and location of all welds and bends
- (12) Type and location of hangers, sleeves, braces, and methods of securing pipe, and seismic calculations
- (13) All control valves, check valves, drain pipes, and test connections
- (14) Make, type, model and size of alarm, dry pipe, or deluge valve
- (15) Type and location of alarms
- (16) Size and location of standpipes, hose outlets, hand hose, nozzles, cabinets, and related equipment with details from the manufacturer including model numbers and sizes
- (17) Information on the hydraulic data plate
- (18) Hydraulic reference points shown on plan including the top view, section view, and isometric view, that correspond with comparable reference points on the hydraulic calculation sheets
- (19) The setting for pressure-reducing and pressure-restricting valves including direct-acting and pilot-operated valves, and provide a detail for each unique installation configuration

- (20) For automatic and semiautomatic standpipe systems, size and location of hydrants, including static and residual hydrants used in flow test
- (21) Size, location, and piping arrangement of fire department connections with details of the connection
- (22) Scale and graphical representation of the scale
- (23) Hose valve manufacturer and model
- (24) Pressure-reducing valve(s) manufacturer and model
- (25) Required pressure at hose outlet
- (26) Location of hose valves used in hydraulic calculations
- (27) Standpipe system demand (flow and pressure) at the following locations:
  - (a) Fire department connection (FDC) inlet
  - (b) Fire pump discharge flange
  - (c) Water supply truck discharge
  - (d) Water supply source if different from (a) through (c)
- (28) Provide a detailed narrative describing the scope of work to be conducted including the system type and class, minimum and maximum pressure requirements, the type of freeze protection if applicable, the total quantity of hose valves being installed, and the pressure required for the hydrostatic test, being 200 psi or 50 psi above pump churn pressure, whichever is higher
- (29) Nevada State Fire Marshal registration number
- (30) Signature and NICET number, or engineer's seal, of the designer
- (31) General notes as required by the AHJ
- (32) Provide an isometric view showing the entire system in one view including hydraulic reference points
- (33) Full height cross section with ceiling construction
- (34) Location of fire walls, partitions, and horizontal exits
- (35) Label and name of each area or room
- (36) Underground pipe size, length, location with respect to the building, weight, material, and point of connection to city main; type of valves, meters, and valve pits; and depth at which the top of the pipe is laid below grade
- (37) Provide information regarding the fire pump, as applicable
- (38) Provide a detail of each required sign
- (39) Plan view shall show supply and drain pipe layout, pipe dimensions, attachments, braces, hangers, standpipe hose outlets, hydraulic nodes, and the coverage area from each hose valve to the remote areas of the floor plan. The coverage area shall be shown on plans and be measured along the path of travel from hose valves, around walls and through doors, to the most remote areas of the floor. The 30 feet distance assigned to the hose stream shall not be allowed to bend or turn
- (40) Provide a detail of Class I, Class II, or Class III hose valves located in cabinets. The cabinet size and the placement of items within the cabinet shall be such to provide minimum clearances of 6 inches perpendicularly from the face of the valve, 1 inch around the circumference of the valve, and 6 inches around the circumference of the hose outlet cap.
- (41) Where the equipment is to be installed is an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear
- (42) Provide details for penetrations of standpipe piping through walls, floors, and other structural members. Show detail to note clearances around the piping and/or locations of flexible connections
- (43) Provide details for all penetrations in rated walls and floors, providing information regarding the method of maintaining fire rating of the wall or floor
- (44) Where direct-acting pressure regulating hose valves are provided anywhere in the building, provide a chart on the plans. The chart shall have eight columns, as follows:
  - a. Floor Level – Provide numerical designation for all floor levels in the building
  - b. Static Pressure, Inlet – Indicate the static pressure at the inlet of the hose valve on all floor levels. Provide a supporting hydraulic calculation at zero flow with churn pressure, providing a node at the hose valve on each floor level to indicate the static pressure at each hose valve.
  - c. Residual Pressure, Full Flow, Inlet – Indicate the residual pressure at the inlet of hose valves on each floor. Provide a supporting hydraulic calculation at full standpipe design flow per NFPA 14 (750 or 1,000 gpm), providing a node on each floor level to indicate the residual pressure at each hose valve.

- d. Residual Pressure, 250-gpm flow, inlet - Indicate the residual pressure at the inlet of hose valves on each floor while flowing 250 gpm. Provide a supporting hydraulic calculation at 250 gpm flow at the most remote standpipe outlet, providing a node on each floor level of the most remote standpipe to indicate the residual pressure at each hose valve.
  - e. Valve Make and Model – Indicate the manufacturer of the valve on all floors, and the model number for the specific valve. Provide supporting manufacturer specifications.
  - f. Valve Setting – Indicate the hose valve setting or bonnet number proposed for each valve. The setting or bonnet number must be associated with the manufacturer specifications for the valve.
  - g. Residual Pressure, Full Flow, Outlet – Indicate the residual outlet pressure at the outlet of the hose valve under the full-flow condition. For PRV installations, the residual pressure is taken from pressure relation charts provided by the manufacturer. For non-PRV installation, the residual pressure is taken by analysis of the equivalent lengths of the fittings and the hose valve.
  - h. Residual Pressure, 250-gpm flow, Outlet - Indicate the residual outlet pressure at the outlet of the hose valve when flowing 250 gpm. This is necessary to establish the residual pressure expected during field inspection. For PRV installations, the residual pressure is taken from pressure relation charts provided by the manufacturer.
- (45) Edition year of NFPA 14 to which the standpipe system is designed

#### **11.5.5.1.2 - SN**

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

#### **12.7.2 - SN**

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

## NFPA 20

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**4.2.1.1 - CC**

**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

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**4.8.1 - CC**

**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.

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**4.11.1.1 - SN**

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

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**4.11.2.1 - SN**

**4.11.2.1** Unless the requirements of 4.11.2.4 are met, a liquid-filled gauge having a dial not less than 3.5 in. (89 mm) in diameter shall be connected to the suction pipe near the pump with a 0.25 in. (6 mm) gauge valve.

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**4.15.4.1 - SN**

**4.15.4.1** All pumps supplied by municipal water supply shall be installed with a bypass. (See *Figure A.4.15.4.*)

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**9.3.1 - CC**

**9.3.1** Unless there is an installed power arrangement described in 9.3.3, at least one alternative source of power shall be provided.

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**9.3.4 - SN/CC**

**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.
- (3) Design of temporary portable generator with generator plug, transfer switch, and wiring to service back-up power to electric driver. The design shall indicate the minimum required size of the temporary portable generator. The manual transfer switch shall be sized to connect the prescribed temporary portable generator to the fire pump. The switch shall be shown on the approved electrical plans and a copy submitted with the electric fire pump submittal. Written instructions on the set-up of the temporary portable generator, including plug and use of the transfer switch, shall be left with the owner. The time limit from loss of power to installation of the temporary portable generator is a maximum of 2 hours.

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**10.2.1 - SN**

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

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#### 10.4.7.1.1 - SN

**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.

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#### 12.2.1 - SN

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

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#### 12.4.2.1.1 - SN

**12.4.2.1.1** Where the fire pump serves a building equipped with a Fire Command Center, the signal(s) required remote from the controller shall be indicated both on a dedicated panel provided by the fire pump manufacturer and on the fire alarm control panel.

### NFPA 22

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#### 5.1.1.1 - SN

**5.1.1.1** Steel tanks shall be designed in accordance with AWWA D100, *Welded Steel Tank for Water Storage*, 2011, or AWWA D103, *Factory-Coated Bolted Steel Tanks for Water Storage*, 2014.

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#### 14.4.1 - SN

**14.4.1** A permanent pipe connected to a water supply shall be provided to fill the tank, except as provided in 14.4.1.1. Where the tank serves as a break tank between the city supply and fire pump(s), the fill shall be through automatic fill valves that are tied to water level sensors, and a bypass line of equal size with a normally closed control valve shall be provided.

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#### 14.4.2 - SN

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

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#### 14.6.1.1 - SN

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

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#### 14.9.1.1 - SN

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

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**NFPA 24****6.6.2 - SN**

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

- (1) On each bank on a river, pond, or lake where a main crosses water
- (2) Outside the building foundation(s) where a main or a section of a main is installed under a building
- (3) On the underground line where there are two sources of water, after every 2 fire hydrants or building fire sprinkler connections

**NFPA 72****10.4.4 - SN**

**10.4.4\*** In areas that are not continuously occupied, automatic smoke detection shall be provided at the location of each fire alarm control unit(s), notification appliance circuit power extenders, and supervising station transmitting equipment to provide notification of fire at that location.

*Exception No. 1: Where ambient conditions prohibit installation of automatic smoke detection, automatic heat detection shall be permitted.*

*Exception No. 2: Dedicated function sprinkler monitoring systems shall not be required to have smoke detectors installed above the dedicated function control unit.*

**12.2.3 - SN**

**12.2.3\*** The installation of all pathway wiring, cable and equipment shall be in accordance with *NFPA 70, National Electric Code* and the applicable requirements of 12.2.3.1 through 12.2.3.3. In all occupancies, other than residential two stories or less, all wiring, including optical fiber cables, shall be in enclosed metallic conduit or shall be MI, MC, or AC cable. (SIG-FUN)

**18.3.2.4 - SN**

**18.3.2.4** Voltage drop calculations shall be performed using one of the following methods:

- (1) The lump sum calculation method, which shall be calculated as follows:
  - (a) Calculate the voltage drop using one of these formulas:
    - i.  $V_D = I * ((R * 2 * L)/1,000)$  **OR**
    - ii.  $V_D = (2 * K * I * L)/CM$ .
  - (b) Subtract this calculated voltage drop from 20.4 volts ( $V_S$ ) in order to get the voltage value at the end of the circuit ( $V_S - V_D = V_{EOL}$ ). The value for  $V_{EOL}$  shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

- (2) The point-to point method, which requires a math-intensive approach where the voltage drop between each notification appliance is reiterated. This method is best done by utilizing a spreadsheet program. The calculated voltage at the last device on the circuit shall be a minimum of 16 volts (the minimum operating voltage required for a listed 24 vdc notification device).

Where:

$V_D$  = Voltage Drop

$V_S$  = Starting voltage (20.4vdc, or the end of useful battery life)

$V_{EOL}$  = Voltage at the end-of-line resistor

$I$  = Total load of the circuit in amperes utilizing current draws for each notification appliance @ 16vdc (the UL maximum draws at the minimum listed voltage).

$R$  = Resistance in ohms per 1,000 feet, with respect to conductor

$K$  = 10.64 ohms (the constant representing the mil-foot resistance of copper wire)

$L$  = length of circuit in feet (distance from panel to end-of-line resistor for class B circuits)

$CM$  = circular mill of wire, with respect to conductor.

$V_{SOURCE}$  = voltage calculated at the previous device

**Conductor Properties NEC Chapter 9 Table 8 (Uncoated Copper), see AHJ for other values**

Wire	R (1-Strand / 7 Strand)	CM
No 18	7.77 / 7.95	1,620
No 16	4.89 / 4.99	2,580
No 14	3.07 / 3.14	4,110
No 12	1.93 / 1.98	6,530

#### 18.4.1.4 - SN

**18.4.1.4** Audible notification appliances for alert and evacuation signal tones shall meet the requirements of 18.4.1.5.

#### 18.4.1.5 - SN

**18.4.1.5** The tone portion of Voice messages shall ~~not~~ be required to meet the audibility requirements of IFC 907.5.2.1.1. 18.4.3 (Public Mode Audible Requirements), 18.4.4 (Private Mode Audible Requirements), 18.4.5 (Sleeping Area Requirements), or 18.4.6 (Narrow Band Tone Signaling for Exceeding Masked Thresholds), but The voice portion of voice messages shall meet the intelligibility requirements of 18.4.10 where voice intelligibility is required.

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#### 18.4.2.4 - SN

**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.*

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#### 18.5.5.4.2 - SN

**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.*

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#### 18.5.5.6.2 - SN

**18.5.5.6.2** Documentation provided to the authority having jurisdiction shall be stamped by a licensed engineer or prepared by a NICET Level IV fire alarm designer and shall include the following:

- (1) Inverse Square Law calculations using each of the vertical and horizontal polar distribution angles in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, or equivalent.
- (2) The calculations shall account for the effects of polar distribution using one of the following:
  - a. The percentages from the applicable table(s) in ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*, or equivalent.
  - b. The actual results of laboratory tests of the specific appliance to be used as recorded by the listing organization.

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#### 18.5.5.8 - SN

**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.



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### 21.7.2 - SN

**21.7.2\*** If connected to the fire alarm system serving the protected premises, all detection devices used to cause the operation of HVAC systems smoke dampers, fire dampers, fan control, smoke doors, or fire doors shall be monitored for integrity in accordance with Sections 12.6 and 23.8.5.4.6.

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### 21.7.9 - SN

**21.7.9** Where duct detectors are installed in accordance with the UMC Section 608.1, automatic shut-off shall be accomplished by interrupting the power source or utilizing the stop input, if provided on the air moving equipment.

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### 23.2.2.4 - SN

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

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### 23.8.5.1.2 - SN

**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.

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### 23.8.5.9.1 - SN

**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.

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### 23.8.5.9.3 - SN

**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.

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### 23.8.5.9.4 - SN

**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.

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### 23.8.6.3.2 - SN

**23.8.6.3.2** The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over

into another notification zone. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

### 23.8.6.5 - SN

**23.8.6.5 Emergency Voice/Alarm Communication Notification Appliance Circuits.** Emergency voice/alarm communication notification appliance circuits shall be capable of full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) as determined in accordance with Sections 23.8.6.5.1, 23.8.6.5.2 or 23.8.6.5.3.

**23.8.6.5.1 Power Loss Calculations.** A calculation for each circuit shall be provided to the authority having jurisdiction demonstrating simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB). Power loss calculations similar to the following shall be used:

$$P_{Loss} = 10 * \text{Log} [1 - ((2 * RL) / (2 * RL + (V_{Line} \text{ squared} / P_{Rated})))]$$

$$RL = (R_{Ref} / 1000) * D$$

With variables defined as follows:

D = length of wire used (in feet)

P<sub>Loss</sub> = power loss (in dB)

P<sub>Rated</sub> = power driven on line from the amplifier (in watts)

RL = wire gauge resistance (in ohms)

R<sub>Ref</sub> = wire resistance based on gauge of wire used (in ohms/ft.)

V<sub>Line</sub> = voltage on line (typically 25 volts or 70 volts)

Alternatively the distance may be calculated using a calculation similar to:

$$D = (61 / R_{Ref}) * (V_{Line} \text{ squared} / P_{Rated})$$

**23.8.6.5.2 Power Loss Tables.** To ensure circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB), wiring shall be limited to the distance allowed in Tables 23.8.6.5.2.a and 23.8.6.5.2.b.

**Table 23.8.6.5.2.a, 25 V Circuit  
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss**

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	12	19	31	49	79
150	16	26	41	66	105
100	25	39	62	99	158
75	33	52	83	132	210
60	41	65	104	165	263

50	49	78	124	198	315
40	61	97	155	247	394
30	82	130	207	329	525
25	98	156	248	395	630

**Table 23.8.6.5.2.b, 70 V Circuit  
Loudspeaker Distribution Cable Length (in feet) and Gauge for 0.5-dB Loss**

Wire Gauge (AWG)	18	16	14	12	10
Cable Ohms*	15.54	9.78	6.14	3.86	2.42
Circuit Power					
200	98	156	248	395	630
150	131	208	331	527	840
100	196	312	497	790	1260
75	262	416	662	1053	1680
60	327	520	828	1317	2100
50	392	624	993	1580	2520
40	491	780	1242	1975	3150
30	654	1039	1656	2633	4200
25	785	1247	1987	3160	5041

\*Cable Ohms is expressed in ohms per 1000 feet (2008 NEC Ch.9 Table 8, uncoated, single strand copper, see NEC or AHJ for other values)

The length represented accounts for both wires in the circuit.

**23.8.6.5.3 Manufacturers Power Loss Calculator.** When allowed by the authority having jurisdiction manufacturers calculations showing circuits are capable of simultaneous full-load operation with a wiring power loss not to exceed 12.5% (0.5dB) are acceptable.

#### 24.4.2.9.4 - SN

**24.4.9.4** The boundaries of notification zones shall be coincident with building outer walls, fire walls, fire barriers, or fire-resistance rated horizontal assemblies. Sprinkler systems serving a notification zone shall not cross over the notification zone boundary. For high-rise buildings, alarms shall activate on the floor of, floor below, and floor above the floor of incidence. For all other buildings, alarms shall activate throughout the notification zone of incidence.

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**NFPA 160****7.1.6 - CC**

**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<sup>2</sup>

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 of 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

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**8.1.3 - CC**

**8.1.3** The operator shall be licensed in accordance with NRS 477 and NAC 477.

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**NFPA 1123****10.1.4 - CC**

**10.1.4** The operator shall be licensed in accordance with NRS 477 and NAC 477

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**NFPA 1126****6.5.1.3 - CC**

**6.5.1.3** The operator shall be licensed in accordance with NRS 477 and NAC 477

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**8.1.6.3 - CC**

**8.1.6.3** Indoor pyrotechnic displays shall only be permitted in venues provided with automatic fire sprinklers throughout

NFPA 2001

5.3.7 - CC

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**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)