



CITY OF SURPRISE
Board of Construction Review Meeting
16000 N. Civic Center Plaza
Surprise, AZ 85374
Thursday, October 3, 2019 @ 5:30 PM
COUNCIL CHAMBERS

- A. Call To Order
- B. Roll Call
- C. Pledge of Allegiance
- D. Current Events and Reports
- E. Staff Reports
- F. Call To The Public
- G. Board of Construction Review Agenda:

CONSENT AGENDA:

REGULAR AGENDA ITEM - NON-PUBLIC HEARING:

- 1. Citywide Presentation and Discussion of the 2018 International Building and Fire Codes Adoption Ordinance Including Local Amendments Chris Boyd
Community Development
- H. Other Business and Future Agenda Items
- I. Adjournment

SHERRY ANN AGUILAR, CITY CLERK, MMC

POSTED: September 26, 2019 at 3:40 PM

SPECIAL NOTE: PERSONS WITH SPECIAL ACCESSIBILITY NEEDS, INCLUDING LARGE PRINT MATERIALS OR INTERPRETER, SHOULD CONTACT THE CITY CLERK'S OFFICE @ 623.222.1200 OR TTY 623.222.1002, BY NO LATER THAN 24 HOURS IN ADVANCE OF THE REGULAR SCHEDULED MEETING TIME.



CITY OF SURPRISE Board of Construction Review Meeting

Council Meeting Date: October 3, 2019

Contact Person: Chris Boyd, AD - BS DV & CD
ENF

Submitting Department: Community Development District: Citywide

Staff Recommendations:

Consent: No	Regular: No	Public Hearing: No	Report/Discussion: Yes
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Agenda Wording:

Presentation and Discussion of the 2018 International Building and Fire Codes Adoption Ordinance Including Local Amendments

Motion:

Presentation and Discussion Only

Background:

After the June 4, 2019 City Council Work Session, the proposed local amendments were made available on the City Website for a 60 day public comment period. One public comment was received. This comment suggested that hot water recirculation pumps should be made mandatory for all new home construction. These pumps are currently offered as optional equipment by most home builders. Builders also offer other energy efficient water heating options. Staff feels that homeowners who would want this plumbing/electric feature, have the opportunity to have it installed as part of the new home build without every homeowner incurring the cost if it was a mandatory code requirement.

Building Safety staff also contacted our strategic partners at the Arizona Multihousing Association (AMA) and the Home Builders Association of Central Arizona (HBACA). HBACA suggested three amendments that provide homebuilders more clearly defined options for code compliance. HBACA suggested the use of sampling for energy code compliance, defining how to measure the distance from the home to the property line and make-up air requirements for very large residential range hoods were studied by staff members and integrated into the Local Amendments. These additional amendments will provide clarification on procedures and provide an ultimate cost savings to new home buyers.

The presentation today highlights new code provisions and local amendments for the individual code volumes. Most new code provisions are clarifications of previous code editions or codification of new technologies, systems or construction methods. Local amendments are developed to facilitate compliance with Federal standards, State statutes and County requirements as well as to utilize regional best practices for building design and construction.

Objective Analysis:

The adoption of any new building code requires approval of the City Council by ordinance. Staff will recommend that the Mayor and City Council adopt the 2018 I-Codes and Local Amendments at the

Regular Meeting on Oct 15, 2019. The 2018 I-Codes and local amendments would then become effective on November 14, 2019.

Policy Compliant:

This action is compliant with City and Council policy.

Financial Impact:

Approval of the 2018 I-Codes will not significantly impact costs for construction within the City or current permit and inspection projections.

Budget Impact:

This action does not have a budgetary impact.

FTE Impact:

This action does not impact FTE staffing levels.

ATTACHMENTS:

1. 19.09.26 EVR BCR Staff Report - 2018 I-Code Adoption
 2. Master 2018 Amendments June 26 Version
 3. BCR 2018 I-Codes Overview
-

Date: October 3, 2019

To: Board of Construction Review

From: Chris Boyd, Acting Community Development Director
Keith Tanner, Fire Marshal
Brigham Bennett, Plans Examiner

Re: **Adoption of 2018 International Building and Fire Code with Local Amendments**

INTRODUCTION

Building Safety staff previously met with both the City Council and the Board of Construction Review to discuss the process of adopting the 2018 I-Codes as the currently adopted building code in the City of Surprise.

Since our last discussion, the 60 day public comment period has been completed. Four comments were received. Three comments suggested by the Home Builders Association of Central Arizona were implemented in the 2018 International Residential code amendments. Proposals were made for sampling protocols to be used for energy code compliance, one that employs a standard method for measuring of building separation, and another for the use of make-up air for large residential kitchen hoods. All of these suggestions were studied by staff and implemented into the local amendments. The public comment to require the use of hot water recirculation pumps was not included. Many homebuilders already provide this option as well as the use of tankless water heaters.

The adoption of the 2018 I-Codes will replace the currently adopted 2012 I-Codes which have been in effect since September 1, 2014.

BACKGROUND

The **2018 International Building Code** contains new definitions for code compliance clarity. A proposed local change to exempt accessory structures from permit is utilized to align with a similar residential exemption. The local amendments provide compliance with State of Arizona requirements for Assisted Living Homes. The local best practice for using structural steel reinforcement in masonry walls is also continued forward.

The **2018 International Residential Code** also has new definitions. Any accessory structure 200 square feet or less will be exempt from permitting. Building design criteria based on local conditions are set forth by amendment. The local amendments transfer jurisdiction of flood plain administration to the Maricopa County Flood Control District and of manufactured housing to the Arizona Office of Manufactured Housing. The City's Sound Attenuation and Swimming Pool Barrier requirements are also specified within the local amendments.

The **A117-1 2009 Standard for Accessible and Usable Buildings and Facilities** allows the Federal standards of the Americans with Disabilities Act to be codified. The only proposed amendment is for the use of the Accessibility Icon pictogram.

The **2018 International Energy Conservation Code** amendments include provisions for multi-tenant residential building to choose either the commercial or residential track for compliance. The amendments also include the State of Arizona requirement for the use of variable speed pool pumps.

The **2018 International Mechanical Code, 2018 International Plumbing Code, 2018 International Fuel Gas Code** and the **2017 National Electrical Code** have minor code changes and limited amendments. Staff would note the continued IMC requirements for mechanical building cooling to 70 degrees F.

The **2018 International Green Construction Code** and the **2018 International Existing Building Code** both provide voluntary compliance avenues to designers and builders. In the five year period that the 2012 I-Codes have been in effect, no projects have utilized either code. Building Safety staff recognizes the importance of maintaining these voluntary paths despite their limited use.

IMPLEMENTATION

At the Regular Meeting on October 15, 2019, staff will request that the Mayor and City Council adopt the 2018 I-Codes and local amendments by ordinance with a 30 day effective date of November 14, 2019. Building permit applications received on or after November 14, 2019 would utilize the 2018 I-Codes and local amendments as the criteria for approval. Copies of the building codes and the local amendments will be located at the City Clerk's office as a public record. An electronic copy of the ordinance will be placed on the Building Safety webpage.

RECOMMENDATION

The purpose of this meeting is to be informational and to provide a highlight of the new code requirements and an overview of the local amendments. No action is necessary at this time.

City of Surprise

Local Amendments

2018 International Building Code
2018 International Residential Code
2018 International Fire Code
2018 International Mechanical Code
2018 International Plumbing Code
2018 International Fuel Gas Code
2018 International Energy Conservation Code
2018 International Existing Buildings Code
2017 National Electrical Code
2018 International Green Construction Code



2018 International Building Code

Local Amendments

Including appendices C and H

101.1 Title. These regulations shall be known as the Building Code as amended by the City of Surprise, hereinafter referred to as “this code.”

105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures ~~used as tool and storage sheds, playhouses and similar uses,~~ provided the floor area is not greater than ~~120-200~~ square feet (~~11 18.58~~ m²).
2. Fences not over 7-6 feet (~~2134 mm-1829 mm~~) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Platforms, sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television, and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than ~~24-18~~ inches (610 mm) deep.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
13. Non-fixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

14. Re-roofing with the same type of material as the original roofing and provided not more than two layers of asphalt shingles are applied over an existing asphalt shingle roof.
15. Installation of a nonstructural weatherproof exterior covering over an existing weatherproof covering on an existing structure so long as the new covering will not affect the fire-resistive classification of the existing structure.

Exception: Installation of an Exterior Insulation and Finish System (EIFS).

105.5 Expiration. Every *permit* issued shall become invalid unless the work on the site authorized by such permit is commenced with 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced. The *building official* is authorized to grant, in writing, one or more extension of time, for periods not more 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. A permit shall be considered expired if more than 180 days shall pass between approvals of inspections listed in Section 109. When a permit expires by limitations and has become null and void, and the *building official* has not been notified in writing by the permit applicant that no work was done under the permit, the *building official* may file a "Notice of Non-Compliance" with the Maricopa County Recorder's Office for failure of obtaining the required inspections.

105.5.1 Completing Work and Final Inspection. Every permit issued by the building official shall expire 24 months after the date of permit issuance. If the building or work authorized by such permit has not received final inspection approval prior to the permit expiration date, all work shall stop until a new permit is obtained for the value of the work remaining unfinished.

Exception: The building official may approved a period exceeding 24 months for completion of work when the permit holder can demonstrate that the complexity or size of the project makes completing the project within 24 months unreasonable. Any request shall be prior to expiration of the permit.

109.4 Work commencing before permit issuance. Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall may be subject to a fee established by the building official that shall be in addition to the required permit fees.

SECTION 113 BOARD OF APPEALS

[A] 113.1 General. Appeals shall be in accordance with the Surprise Municipal Code. Whether to hear and decide appeals or orders, decisions or determinations made by the Building Official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeal shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.

~~[A] 113.2 Limitations on authority.~~ An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

~~[A] 113.3 Qualifications.~~ The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

SECTION 202 DEFINITONS

ASSISTED LIVING CENTER An assisted living facility that provides resident rooms or residential units to eleven or more residents.

ASSISTED LIVING FACILITY A residential care institution, including adult foster care, that provides or contracts to provide supervisory care services, personal care services or directed care services on a continuing basis.

ASSISTED LIVING HOME An assisted living facility that provides resident rooms to ten or fewer residents.

DIRECTED CARE SERVICE Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions.

PERSONAL CARE SERVICE The care of persons who do not require medical care. Personal care involves responsibility for the safety of persons while inside the building. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and administration of medications or treatments.

SUPERVISORY CARE SERVICE General supervision, including daily awareness of resident functioning and continuing needs.

308.2 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons who reside on a 24 hour basis in a supervised environment, and receive *custodial care*, and the persons receiving care are capable of self-preservation, except as provided for assisted living centers. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities-centers

Congregate care facilities

Convalescent facilities

Group homes

Halfway houses

Residential board and *custodial care* facilities

Social rehabilitation facilities

308.2.3 Six to sixteen persons receiving care. A facility such as above, housing not fewer than six and not more than 16 persons receiving such care, shall be classified as Group R-4, except as provided for assisted living homes.

308.3 Institutional Group I-2. This occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for one or more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes

Assisted Living Centers

Psychiatric hospitals

~~**308.3.2 Five or fewer persons receiving care.** A facility such as the above with five or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.~~

310.4.1 Care facilities within a dwelling. Licensed care facilities for five-10 or fewer persons receiving care that are within a single-family dwelling are permitted, to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.1.3 or Section P2904 of the *International Residential code* provided that the requirements of Section 425 of this code are met.

EXCEPTIONS:

1. Family Foster Homes and Foster Group Homes licensed by the State of Arizona Department of Economic Security.
2. Group Homes for the Developmentally Disabled and Behavioral Health Group Homes which serve six or less residents and are licensed by the State of Arizona Department of Health Services.

310.5 Residential Group R-4. This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. The persons receiving care are capable of self-preservation, except as provided

for assisted living homes. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living ~~facilities~~ homes

Congregate care facilities

Convalescent facilities

Group homes

Halfway houses

Residential board and *custodial care* facilities

Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code and Section 429.

310.5.1 Condition 1. ~~This occupancy condition shall include buildings in which all person receiving custodial care, without any assistance, are capable of responding to an emergency situation to complete building evacuation.~~ This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of self-preservation by responding to an emergency situation without physical assistance from staff. Condition 1 facilities housing more than 10 persons shall be classified as Group I-1

310.5.2 Condition 2. ~~This occupancy condition shall include buildings in which there are any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation.~~ This occupancy condition shall include facilities licensed to provide personal or directed care services, in which occupants are incapable of self-preservation by responding to an emergency situation without physical assistance from staff. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

EXCEPTIONS:

1. Family Foster Homes and Foster Group Homes licensed by the State of Arizona Department of Economic Security.
2. Group Homes for the Developmentally Disabled and Behavioral Health Group Homes which serve six or less residents and are licensed by the State of Arizona Department of Health Services.

SECTION 429

ASSISTED LIVING HOMES

429.1 Applicability. The provisions of this section shall apply to a building or part thereof housing not more than 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment, which provides licensed care services. Except as specifically required by this division, R-4 occupancies shall meet all the applicable provisions of Group R-3.

429.2 General. Building or portions of buildings classified as R-4 may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building and shall not exceed two thousand square feet above the first story, except as provided in Section 506.

429.3 Special Provisions. R-4 occupancies having more than 2000 square feet above the first story shall be of not less than one-hour fire-resistive construction throughout.

429.3.1 Mixed Uses. R-4 occupancies shall be separated from other occupancies as provided in Table 508.4.

429.4 Access and Means of Egress Facilities

429.4.1 Accessibility. R-4 occupancies shall be provided with a concrete landing and ramp outside of the main entrance to comply with sections 1008.1.6, 1010.3, 1010.7.1 and 1010.10. Thresholds at the main entrance shall comply with section 1008.1.7.

429.4.2 Exits

429.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms used by residents may have only one means of egress as provided in Chapter 1.

429.4.2.2 Distance to Exits. The maximum travel distance shall comply with Section 1016, except that the maximum travel distance from the center point of any sleeping room to an exit shall not exceed 75 feet.

429.4.2.3 Emergency Exit Illumination. In event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the National Electric Code.

429.4.2.4 Emergency Escape and Rescue. R-4 occupancies shall comply with the requirements of Section 1029, except that Exception #1 to 1030.1 does not apply to R-4 occupancies.

429.4.2.5 Delayed Egress Locks. In R-4 Condition 2 occupancies, delayed egress locks shall be permitted in accordance with 1010.1.9.7, Items 1, 2, 4, 5, and 6.

429.5 Smoke Alarms and Sprinkler Systems.

429.5.1 Smoke Alarms. R-4 occupancies shall be provided with smoke alarms installed in accordance with IFC 907.2.11.2, and such alarms shall be installed in all habitable rooms.

429.5.2 Sprinkler Systems. R-4 occupancies shall be provided with a sprinkler system installed in accordance with IFC 903.3.1.3. Sprinkler systems installed under this section shall be installed throughout, including attached garages, and in Condition 2 facilities, shall include concealed spaces of or containing combustible materials. Such systems may not contain unsupervised valves between the domestic water riser control valve and the sprinklers. In Condition 2 occupancies, such systems shall contain water flow switches electrically supervised by an approved supervising station, and shall sound an audible signal at a constantly attended location.

CHAPTER 9

FIRE PROTECTION SYSTEMS

DELETE the entire Chapter. All references per the 2018 International Fire Code Chapter 9 as amended by this ordinance.

1111.1 Signs. Required *accessible* elements shall be identified by the International Symbol of Accessibility at the following locations:

1. *Accessible* parking spaces required by Section 1106.1.
 - a. *Accessible* parking spaces may also be identified by the use of the Accessibility Icon.

Exception: Where the total number of parking spaces provided is four or less, identification of *accessible* parking is not required.

2. *Accessible* parking spaces required by Section 1106.2.

Exception: In Group I-1, R-2, R-3 and R-4 facilities, where parking spaces are assigned to specific *dwelling units* or *sleeping units*, identification of *accessible* parking spaces is not required.

3. *Accessible* passenger loading zones.
4. *Accessible* rooms where multiple single-user toilet or bathing rooms are clustered at a single location.
5. *Accessible* entrances where not all entrances accessible.

6. *Accessible* check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the check-out aisle number or type of check-out identification.
7. Family or assisted-use toilet and bathing rooms.
8. *Accessible* dressing, fitting and locker rooms where not all such rooms are *accessible*.
9. *Accessible* areas of refuge in accordance with Section 1009.9
10. Exterior areas for assisted rescue in accordance with Section 1009.9
11. In recreational facilities, lockers that are required to be *accessible* in accordance with Section 1109.9.

1111.2 Directional signage. Directional signage indicating the route to the nearest like *accessible* element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility or the Accessibility Icon and sign characters shall meet the visual character requirements in accordance with ICC A117.1

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an *accessible route*.
4. At each separate-sex toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room where provided in accordance with Section 1109.2.1
5. At exits and *exit stairways* serving a required *accessible* space, but not providing an *approved accessible means of egress*, signage shall be provided in accordance with Section 1009.10.
6. Where drinking fountains for persons using wheelchairs and drinking fountains for standing persons are not located adjacent to each other, directional signage shall be provided indicating the location of the other drinking fountains.

1203.1 Equipment and systems. ~~Habitable spaces~~ ~~Interior spaces~~ intended for human occupancy shall be provided with active or passive space-heating and space-cooling systems capable of maintaining a minimum indoor temperatures between 70 °F (21°C) and 84 °F (29°C) at a point 3 feet (914 mm) above the floor on the design heating day.

Exception: Space heating and cooling systems are not required for interior spaces where the primary purpose of the space is not associated with human comfort.

1607.2 Loads not specified.

TABLE 1607.1

**MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o , AND MINIMUM
CONCENTRATED LIVE LOADS⁹**

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
25. Residential		-
One- and two-family dwellings		
Uninhabitable attics with storage ^{i,j,k}	20 <u>40</u>	
Habitable attics and sleeping areas ^k	30 <u>40</u>	
(no other changes in item 25)		

1612.3 Establishment of flood hazard areas. To establish *flood hazard areas*, the applicable governing authority shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled “The Flood Insurance Study for Maricopa County, Arizona and Incorporated Areas revised on July 19, 2001, as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

1704.1 General. Special inspections and tests, statements of special inspections, responsibilities of contractors, submittals to the building official and structural observations shall meet the applicable requirements of this section. The building official may also require other special inspections not prescribed in this section as needed.

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in section 1.18 of TMS 402/ACI 530/ASCE 5 depending on the structure’s seismic design category. All new masonry elements, regardless of seismic design category, shall meet the following minimum reinforcement requirements:

1. Connections to columns shall comply with Section 1.18.4.3.2.1 of TMS 402/ACI 530/ASCE 5.
2. Vertical wall reinforcement of at least 0.20 square inch (130 mm sq) in cross-sectional area shall
3. Be provided continuously from support to support at each corner, at each side of each opening, at the ends of walls and at maximum spacing of 4 feet (1219 mm) apart horizontally throughout the wall.
4. Horizontal wall reinforcement not less than 0.20 square inch (130 mm sq) in cross-sectional area shall be provided (1) at the bottom and top of wall openings and

extend not less than 24 inches (610 mm) or less than 40 bar diameters past the opening, (2) continuously at structurally connected roof and floor levels and at the top of walls, (3) at the bottom of walls or in the top of foundations when doweled in walls, and (4) at maximum spacing of 10 feet (3048 mm) unless uniformly distributed joint reinforcement is provided.

5. Where anchor bolts are used to connect horizontal elements to the tops of columns, anchor bolts shall be placed within lateral ties. Lateral ties shall enclose both the vertical bars in the column and the anchor bolts. There shall be a minimum of two No. 4 (M #13) or three No. 3 (M #10) in the top 5 inches (127 mm) of the column.

SECTION 3109

SWIMMING POOLS, SPAS AND HOT TUBS

DELETE section in its entirety

Per Maricopa County Environmental Services Department requirements

2018 International Residential Code

Local Amendments

Including appendices A, B, C, E, G, H, K, N, P, Q, R, S AND T

101.1 Title.

These provisions shall be known as the Residential Code for One and Two-Family Dwellings ~~of~~ as amended by the City of Surprise, and shall be cited as such and will be referred to herein as “this code.”

R105.2 Work exempt from permit. Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:

1. One-story detached accessory structures, provided the floor area is not greater than 200 square feet (18.58 m²).
2. Fences not over ~~7-6~~ feet (~~2134 mm-1829 mm~~) high.
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge
4. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons
5. (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. Sidewalks and driveways.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than ~~24-18~~ inches (610 mm) deep.
9. Swings and other playground equipment.
10. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
11. Decks not exceeding 200 square feet (18.58 m²) in area, that are not more than 30 inches (762 mm) above grade at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.
12. Hot water re-circulators.
13. Water Softeners and Soft Water Loops.
14. Replacement of existing water heaters which are of the same size, type and

method of operation and were previously installed with a valid building permit.

15. Re-roofing with the same type of material as the original roofing and provided not more than two layers of asphalt shingles are applied over an existing asphalt shingle roof.
16. Installation of a nonstructural weatherproof exterior covering over an existing weatherproof covering on an existing structure so long as the new covering will not affect the fire-resistive classification of the existing structure.

Exception: Installation of an Exterior Insulation and Finish System (EIFS).

105.5 Expiration. Every *permit* issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced. The *building official* is authorized to grant, in writing, one or more extension of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. A permit shall be considered expired if more than 180 days shall pass between approvals of inspections listed in Section 109. When a permit expires by limitations and has become null and void, and the *building official* has not been notified in writing by the permit applicant that no work was done under the permit, the *building official* may file a "Notice of Non-Compliance" with the Maricopa County Recorder's Office for failure of obtaining the required inspections.

105.5.1 Completing Work and Final Inspection. Every permit issued by the building official shall expire 24 months after the date of permit issuance. If the building or work authorized by such permit has not received final inspection approval prior to the permit expiration date, all work shall stop until a new permit is obtained for the value of the work remaining unfinished.

EXCEPTION: The building official may approved a period exceeding 24 months for completion of work when the permit holder can demonstrate that the complexity or size of the project makes completing the project within 24 months unreasonable. Any request shall be prior to expiration of the permit.

SECTION R112 BOARD OF APPEALS

R112.1 General. Appeals shall be in accordance with the Surprise Municipal Code. In order to hear and decide appeals of orders, decisions or determinations made by the *Building Official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *Building Official* shall be an ex-officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. 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 *Building Official*.

~~**R112.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**R112.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.~~

~~**R112.4 Administration.** The Building Official shall take immediate action in accordance with the decision of the board.~~

R113.1.1 Occupying or maintaining a non-permitted structure. Any work on a property that has been done without a permit as required by sections R105.1 and R105.2 of this code shall be considered a violation by the current owner of the property regardless of when the work that required a permit was done or who owned the property at the time of construction.

Work shall be defined for this section alone as constructing, enlarging, altering, repairing, moving, demolishing, or changing the occupancy of a building or structure or erecting, installing, enlarging, altering, repairing, removing, converting or replacing any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code.

SECTION R202 DEFINITIONS

[RB] FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:

1. To the closest interior lot line.
2. To the centerline of a street, an alley or a public way.
3. To an imaginary line between two buildings on the lot.

The distance shall be measured at the right angle from the face of the wall framing.

R301.2 Climatic and geographic design criteria. Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2 (1).

Table R301.2 (1)

(Due to space limitations the table could not be reproduced; only the values are listed)

Ground snow load: 0

Wind speed (mph): 115 Exposure B (unless otherwise designated by the Building Official)

Topographic Effects: No

Special Wind Region: No

Windborne Debris Zone: No

Seismic design category: B

Weathering: Negligible

Frost line depth: 0"

Termite: Moderate to heavy

Decay: None to slight

Winter design temperature: None to slight

Ice shield underlayment
required: No Flood hazards: MCFCDD
requirements

Air freezing index: N/A

Mean annual temperature: 72.3°F

R301.2.4 Floodplain Construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with Section R322 the regulations of the Maricopa County Flood Control District. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.

R301.5 Live Load. The minimum uniformly distributed live load shall be as provided in Table R301.5

TABLE R 301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics with limited storage ^{b,g}	<u>20-40</u>
Habitable attics and attics served with fixed stairs	<u>30-40</u>
Sleeping rooms	<u>30-40</u>

(No other changes to Table)

R302.1 Exterior Walls. Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1 (1); or dwellings equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1 (2).

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the lot line used to determine the *fire separation distance*.
2. Walls of *dwellings* and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the lot. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with the code are permitted
6. Metal patio covers that meet the following conditions:
 - 6.1 Attached to the *dwelling*.
 - 6.2 Cannot extend beyond the *exterior wall* when that wall is parallel to the *lot line*.
 - 6.3 The *exterior wall* is 5 feet (1 525 mm) or less from the adjacent *lot line*.

R302.6 Dwelling/garage fire separation. The garage shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. This provision does not apply to garage walls that are perpendicular to the adjacent *dwelling unit wall*.

**Table R302.6
DWELLING/GARAGE SEPARATION**

SEPARATION	MATERIAL
From the residence and attics	Not less than 1/2" gypsum board applied to the garage side <u>Minimum 5/8" Type X gypsum board applied to the garage side</u>

(No other changes to Table)

R303.10 Required heating and cooling. When the winter design temperature in Table R301.2 (1) is below 60°F (16°C). Every *dwelling unit* shall be provided with heating and cooling facilities capable of maintaining a minimum room temperatures between of 70°F(21°C) 68°F (20°C) and 90°F (50°C) at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in all habitable rooms at the design temperature. The installation of one or more portable space heaters or portable space coolers shall not be used to achieve compliance with this section.

R309.5 Fire Sprinklers.

DELETE section in its entirety.

R310.4 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over emergency escape and rescue openings, area wells, or window wells, the minimum net clear opening size shall comply with Sections R310.2.1 through R310.2.3 and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that required for the normal operation of the escape and rescue opening. The dwelling shall be equipped with smoke alarms installed in accordance with Section R314.

SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS

DELETE section in its entirety.

SECTION R322 FLOOD-RESISTANT CONSTRUCTION

R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas ~~(including A or V Zones) as established in Table R301.2(1)~~ shall be designed and constructed in accordance with Section R322. the regulations of the Maricopa County Flood Control District. ~~Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

SECTION R328 FIREPLACE RESTRICTIONS

Per Maricopa County Air Quality Department requirements.

R403.1.1 Minimum size. Minimum sizes for concrete and masonry footings shall be set forth in Table R403.1 and Figure R403.1 (1). The footing width, W, shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Spread footings shall be at least 6 inches (152 mm) in thickness, T. Footing projections, P, shall be at least 2 inches (51 mm) and shall not exceed the thickness of the footing. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood

foundations shall be in accordance with the details set forth in Section R403.2 and Figures R403.1.(2) and R403.1 (3).

Exception: For enclosure of existing carport and patio covers, non-bearing wood framed exterior walls within the projection of the existing roof may be supported on an existing, uncracked concrete slab. The minimum slab thickness shall be 3.5 inches and the construction shall comply with the requirements of R317 for protection against decay.

R502.3.1 Sleeping areas and attic joists. Table R502.3.1(1 2) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and attics that are accessed by means of a fixed stairway in accordance with Section R311.7 provided that the design live load does not exceed ~~30~~ 40 pounds per square foot (~~1.44~~ 1.92 kPa). The allowable span of ceiling joists that support attics used for limited storage or no storage shall be determined in accordance with Section R802.4.

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code. Group R-2 when defined as a Residential Building by section R202, shall have the option of complying under the Commercial Provisions of the code, regardless of height. Once defined as such on the submittal documents, all components of the Commercial Provisions shall be followed.

N1101.4.1 RESNET testing & inspection protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System, Standards Protocol for third party testing and inspections, shall be deemed to meet the requirements of sections R402.4.1.1, R402.4.1.2 and R403.2.2. and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling, in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.
3. Third Party Testing is required for the following items:
 - a. N1102.4.1.1 – Building Envelope – Thermal and Air Barrier Checklist
 - b. N1102.4.1.2 – Testing – Air Leakage Rate
 - c. N1103.3.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 11 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

N1103.3 Ducts. Ducts and air handlers shall be in accordance with Sections N1103.2.1 through N1103.2.3.

N1103.3.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

Exceptions: Ducts or portions thereof located completely inside the building thermal envelope.

1. Ducts or portions thereof located completely inside the building thermal envelope.
2. Supply ducts may be insulated to a minimum of R-6 when one or more of the following conditions are met:
3. Minimum SEER rating of space heating/cooling system is increased to 15.
4. Maximum U-factor is decreased to 0.35 and maximum SHGC is decreased to 0.22 for all fenestration products.
5. Residential buildings that meet the requirements of sections R102.1.1 or R405.
6. Residential buildings with attic radiant barriers in accordance with ASTM C1313, installed in accordance with ASTM C1743.

Section N1103.10.3 Covers-Variable Speed Pool Pumps. ~~Outdoor heated pools and outdoor permanent spas shall be provided with a vapor resistant cover or other approved vapor retardant means. Motors with a total horsepower of one or more for pools and in-ground permanently installed spas shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate and shall be operated with a pump control with the capability of operating the pump at two or more speeds. Residential pool pump motor controls that are sold for use with a two or more speed motor shall have a default circulation speed setting no more than one-half of the motor's maximum rotation rate. Any high speed override capability shall be for a temporary period not to exceed one twenty-four hour cycle without resetting to the default setting.~~

~~**Exception:** Where more than 75 percent of the energy for heating, computed over an operation season of not less than three months, is from a heat pump or an on-site renewable energy system, covers or other vapor retardant means shall not be required.~~

N1102.4.1.2 (R402.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding five air changes per hour in *Climate Zones* 1 and 2, and three air changes per hour in Zones 3 through 8. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported as a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *building official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *building official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

EXCEPTIONS:

1. Additions, alterations, renovations or repairs to existing structures.
2. Conditioned garages.

N1106.4 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value indicated in Table N1106.4 when compared to the ERI *reference design*.

TABLE N1106.4 (R406.4)

MAXIMUM ENERGY RATING INDEX	
CLIMATE ZONE	ENERGY RATING INDEX
1	57
2	57 <u>64</u>
3	57
4	62
5	61
6	61
7	58
8	58

M1503.6 Makeup air required. Where one or more gas, liquid or solid fuel-burning appliance that is neither direct-vent nor uses a mechanical draft venting system is located within a dwelling unit's air barrier, each exhaust system capable of exhausting in excess of 400 cubic feet per minute (0.19 m³/s) shall be mechanically or passively provided with

makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute. Such makeup air systems shall be equipped with not fewer than one damper complying with Section M1503.6.2.

Exception: Make up air is not required for exhaust systems installed for the exclusive purpose of space cooling and intended to be operated only when windows or other air inlets are open.

E3908.8 Types of equipment grounding conductors.

The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

4. Electrical metallic tubing with an additional equipment grounding conductor sized in accordance with Table E3908.12.

Appendix E Local Amendment

DELETE this appendix in its entirety and REPLACE as follows:

Per State of Arizona Office of Manufactured Housing Regulations

Appendix I Local Amendment

DELETE this appendix in its entirety and REPLACE as follows:

Per State of Arizona Department of Environmental Quality Regulations.

Appendix G Local Amendment

DELETE this appendix in its entirety.

SWIMMING POOLS, SPAS AND HOT TUBS

SECTION AG101 GENERAL

AG101.1 General.

The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the lot of a one- and two-family dwelling.

SECTION AG102 DEFINITIONS

AG102.1 General.

For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool"

BARRIER. A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

HOT TUB. See "Swimming pool."

IN-GROUND POOL. See "Swimming pool."

RESIDENTIAL. That which is situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories in height.

SPA, NONPORTABLE. See "Swimming pool."

SPA, PORTABLE. A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product.

SWIMMING POOL. Any structure intended for swimming or recreational bathing that contains water over 18 inches (457 mm) deep at any point, and, other than hot tubs and spas is wider than 8 feet (2400 mm) at any point. This includes in-ground, above ground and on-ground swimming pools and, other than the width, hot tubs and spas.

SWIMMING POOL, INDOOR. A swimming pool which is totally contained within a structure and surrounded on all four sides by walls of said structure.

SWIMMING POOL, OUTDOOR. Any swimming pool which is not an indoor pool.

SECTION AG103 SWIMMING POOLS

AG103.1 In-ground pools.

In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section AG107.

AG103.2 Above-ground and on-ground pools.

Aboveground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section AG107.

SECTION AG104 SPAS AND HOT TUBS

AG104.1 Permanently installed spas and hot tubs.

Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section AG107.

AG104.2 Portable spas and hot tubs.

Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Section AG107.

SECTION AG105 BARRIER REQUIREMENTS

AG105.1 Application.

The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near-drownings by restricting access to swimming pools, spas and hot tubs.

AG105.2 Outdoor swimming pool.

An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be provided with a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an aboveground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm). Any decorative design work on a barrier located entirely upon the subject parcel, and on the side away from the swimming pool, such as protrusions, indentations, or cutouts or other fixed or moveable, attached or unattached objects within 24 inches of the pool barrier, which render the barrier easily climbable, are prohibited. The wall, fence, or barrier shall be at least 20 inches from the water's edge.

2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1.75 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.
5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.
6. Chain link fencing shall not be used as a barrier.
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1.75 inches (44 mm).
8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:
 - 8.1 The release mechanism shall be located on the pool side of the gate at least 5 inches (125 mm) below the top of the gate, and
 - 8.2 The gate and barrier shall have no opening greater than 0.5 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.
 - 8.3 All pedestrian access gates and any other access gates shall have a sign attached to both sides of the gate stating the following: "Protect your children, Keep Gate Closed". Details of minimum sign size, letter type, and color and other specifications of the sign shall be provided by the Building Safety Division.
9. Where a wall of a dwelling or garage serves as part of the barrier one of the following conditions shall be met:
 - 9.1 The pool shall be equipped with a powered safety cover in compliance with ASTM F1346; or
 - 9.2 Openings in the wall of the residence or living area which constitute part of the barrier will be protected in the following ways:

9.2.1 Doors will be protected in one of the following ways:

- 9.2.1.1 Add self-closing, self-latching devices installed on all doors with direct access to the pool area, with the release mechanism located minimum of 54 inches above the floor.
- 9.2.1.2 An alarm shall be installed on all doors with direct access to the pool. The alarm shall sound continuously for a minimum of 30 seconds within seven seconds after the door is opened, and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door.
- 9.2.1.3 Pet doors which provide direct access to the pool prohibited.

9.2.2 Windows with access to the pool area shall be protected in the following ways:

- 9.2.2.1 Emergency escape or rescue windows from sleeping areas with access to the swimming pool will be equipped with a latching device not less than 54 inches above the floor.
- 9.2.2.2 All other openable windows with similar access will also be equipped with a latching device not less than 54 inches above the floor or shall be equipped with a key-lock device that prevents opening the window more than 4 inches.

9.3 Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.

10. Where an aboveground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then:

- 10.1 The ladder or steps shall be capable of being secured, locked or removed to prevent access, or 10.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch- diameter (102 mm) sphere.

AG105.3 Indoor swimming pool. All walls surrounding an indoor swimming pool shall comply with Section AG105.2, Item 9.

AG105.4 Prohibited locations. Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

AG105.5 Barrier exceptions. Spas or hot tubs with a safety cover which complies with ASTM F 1346, as listed in Section AG107, shall be exempt from the provisions of this appendix.

AG 105.6 Retroactivity. The owner of every dwelling with an existing swimming pool or spa which was constructed prior to the effective date of this Appendix G (amended) and to which this Appendix would otherwise apply, must comply with this Appendix not later than one year after the effective date of this Appendix.

AG105.7 Duty to comply. Every person who owns, rents , occupies, or controls a swimming pool or spa to which this Appendix G (amended) applies, shall comply with all the provisions of this Appendix at all times.

AG105.7.1 No person shall construct a swimming pool or spa to which this Appendix applies in a manner, which is not in compliance with this Appendix. No person shall remove, alter, disable, render inoperable, or change, either temporarily or permanently, any device or structure installed or constructed in accordance with this Appendix, in such a manner that the device or structure or the barrier to which it is attached or of which it is a part, is no longer in compliance with this Appendix.

AG105.7.2 Every person who contracts to build a swimming pool or spa to which this Appendix applies, or who contracts to sell, lease or rent a dwelling with a swimming pool or spa to which this Appendix applies, shall, at the time of executing the contract, give to the buyer, lessee, or renter, a copy of this Appendix.

AG105.8 Violations and Penalties. Every person who violates any provision of this Appendix G (amended) is guilty of a misdemeanor, and upon conviction shall be punished by imprisonment for up to six months, or by a fine of not more than two thousand five hundred dollars, or both such fine and imprisonment.

Appendix K Local Amendment

SOUND TRANSMISSION

AK102.2. Sound Attenuation - General. Construction outside the areas designated as having a day-night average sound level 65 decibels or higher as determined by the use of the 1988 noise contour lines developed by the Maricopa County Association of Governments (MAG) shall be deemed to have achieved the interior noise level of 45 decibels specified in ARS 28-8482 when the residences are constructed using one of the following methods:

1. Prescriptive Method:

- 1.1 Exterior wall penetrations by pipe ducts or conduits shall be sealed.
- 1.2 Mail boxes shall not be used through the door or wall.
- 1.3 Windows shall have 2 panes of glass and a sound transmission rating of STC-22. All operable windows shall be weather stripped and air tight in accordance with ASTM E-283-04 Standard. Perimeter window frames shall be sealed.
- 1.4 All exterior side hinge doors shall be solid core wood or insulated hollow metal, at least 1", inches thick and fully weather stripped. All exterior doors other than side hinge doors shall be solid wood, foam filled fiberglass or metal construction.
- 1.5 Fireplaces shall be provided with well-fitting dampers.
- 1.6 Exterior walls shall achieve a minimum overall thermal resistance rating of 18. (Exterior walls shall be at least four inches in nominal thickness and shall be finished on the outside with block, siding, sheathing, or stucco on one inch Styrofoam. A minimum of R-13 fiberglass or cellulose insulation shall be installed continuously throughout the cavity space within the wall.)
- 1.7 All roof spaces shall achieve a minimum overall thermal resistance rating of 30.

2. Performance Method:

- 2.1 A certified statement by a licensed architect or engineer certifying that the residence achieves the requirement of a maximum interior noise level of 45 decibels. The certified statement shall include testing and analysis documentation supporting the statement.

AK102.2.1 Sound Attenuation within the 65 decibel contour. Construction inside the areas designated as having a day-night average sound level 65 decibels as determined by the use of the 1988 noise contour lines developed by the Maricopa County Association of Governments shall be deemed to have

achieved the interior noise level of 45 decibels specified in ARS 28-8482 when the residences are constructed using one of the following methods:

1. Prescriptive Method:

Building systems and components that comply with the Maricopa County Association of Governments 2013 Building Code Amendments and Standards Manual, Section 1229, Appendix A

2. Performance Method:

A certified statement by a licensed architect or engineer certifying that the residence achieves the requirement of a maximum interior noise level of 45 decibels. The certified statement shall include testing and analysis documentation supporting the statement.

2018 International Fire Code

Local Amendments

The following Appendices of the International Fire Code, 2018 Edition, are hereby adopted in their entirety:

- Appendix B - Fire-Flow Requirements for Buildings
- Appendix C - Fire Hydrant Location and Distribution
- Appendix D - Fire Apparatus Access Roads
- Appendix H - Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) Instructions
- Appendix I - Fire Protection Systems-Noncompliant Conditions
- Appendix J - Building Information Sign
- Appendix K - Construction Requirements for Existing Ambulatory Care Facilities
- Appendix L - Requirements for Fire Fighter Air Replenishment Systems
- Appendix M - High-Rise Buildings Retroactive Automatic Sprinkler Requirements
- Appendix N - Indoor Trade Shows and Exhibits

The most recent Editions of the National Fire Codes and Standards published by the National Fire Protection Association (NFPA) as referenced in Chapter 80 of the International Fire Code 2018 edition and the most recent addition of the NFPA 101 Life Safety Code, together with all errata to those codes as adopted by NFPA from time to time.

[A] 101.1 Title. These regulations shall be known as the *Fire Code of the City of Surprise*, hereinafter referred to as “this code”.

[A] 101.2 Scope. The provisions of this code shall supplement all adopted City of Surprise Ordinances relating to fire safety and shall apply to all persons without restriction, unless specifically exempted. This code establishes regulations affecting or relating to buildings, processes, premises and safeguards regarding all of the following:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices.
2. Conditions hazardous to life, property or public welfare in the occupancy of buildings or premises.
3. Fire hazards in the buildings or on the premises from occupancy or operation.
4. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.
5. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

[A] 104.10.2 Suspicious Origin. If the origin is determined to be suspicious by the Fire Investigator or the fire involves a loss of life, the Fire Investigator shall notify the City of Surprise Police Department and shall secure the scene until the Police assume control of the scene and the investigation.

[A] 105.4.1.2 Plan certification for fire alarms, fire detection and occupancy notification. All fire alarm system plans submitted for review and approval shall be reviewed and bear a current review certification stamp and signature of an Arizona Professional Design Registrant or a person holding a Level III National Institute for the Certification of Engineering Technologies (NICET) in Fire Alarm Systems certification. Plan certification for all fire alarm systems shall be accompanied by a certification of competence when required. Shop drawings or a deferral application shall accompany construction documents at the time of submission.

[A] 105.4.1.3 Plan certification for fire sprinklers. Fire sprinkler plans submitted to the fire department for review and approval shall be reviewed and bear a current review certification stamp and signature of an Arizona Professional Design Registrant or a person holding a Level III National Institute for the Certification of Engineering Technologies (NICET) in Water-Based Systems Layout. Shop drawings or a deferral application shall accompany construction documents at the time of submission.

[A] 105.4.1.4 Plan certification for emergency responder radio coverage. All Emergency Responder Radio (ERR) plans submitted for review and approval shall be reviewed and bear a current review certification stamp and signature of an Arizona Professional Design Registrant or a person holding a Level IV National Institute for the Certification of Engineering Technologies (NICET) in Inspection and Testing of Fire Alarm Systems certification and FCC General Radio Operators License (GROL). Plan certification for all emergency responder radio coverage shall be accompanied by a certification of competence when required. Shop drawings or a deferral application shall accompany construction documents at the time of submission.

[A] 105.4.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material and submitted in accordance with the requirements set forth in the Arizona State Board of Technical Registration. Electronic media documents are allowed to be submitted where approved by the fire code official. Re-submittals, modifications or revisions shall include; revision dates, identified by a Cloud Area and Delta, and a response letter addressing each item. Construction documents 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.

[A] 105.4.2.1 Fire protection system shop drawings. Shop drawings for the fire protection system(s) shall be submitted to indicate compliance with this code and the construction documents, and shall be approved prior to the start of any fire protection systems installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

[A] 105.4.2.2 Life safety evaluation report. A life safety evaluation report in accordance with NFPA 101, Section 12.4.1 shall be prepared by an Arizona Professional Design Registrant or a Level IV National Institute for Certification of Engineering Technologies (NICET), prior to submitting construction documents for:

1. High-rise buildings.
2. Covered mall buildings.
3. Buildings containing atriums, where the assembly occupant load exceeds 6000.
4. Storage height exceeding 40 feet (12 192 mm)
5. F and S group occupancies exceeding 400,000 square feet (37 161 216 m²), or other structures determined by the fire code official.

105.6 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.6.1 through 105.6.50

Exception: The temporary Use Permit as required by Section 122-105 of the Surprise Unified Development Code (SUDC) for carnivals; circuses; festivals; fairs; holiday events; exhibitions; performances; grand openings; tent sales; sidewalk sales; temporary retail sales of arts, crafts, souvenirs, gifts, food, and seasonally related items; donation bins; or any event in a public or private street shall act as an operational permit.

[A] 105.7.7 Fire alarm and detection systems and related equipment. A construction permit is required for installation, removal, demolition of or modification to fire alarm and detection systems and related equipment. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.

[A] 105.7.25 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, a temporary stage canopy or a tent having an area in excess of 400 square feet (37 m²)

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains, or extensions attached thereto, when used for funeral services.
3. Tents and awnings open on all sides, which comply with all of the following:
 - ~~3.1. Individual tents shall have a maximum size of 700 square feet (65 m).~~
 - ~~3.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall~~

not exceed 700 square feet (65 m²) total.

3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

[A] 107.2.3 Required annual fire inspections. The following businesses shall have a fire inspection prior to initial licensing and annually thereafter with no more than 13 months between inspections:

1. Assisted living center
2. Assisted living facility
3. Assisted living home

[A] 107.5 Assisted living homes. The annual inspection for Assisted Living Homes shall be completed by August 31st for that year.

1. During the months of July and August the owners and/or managers of Assisted Living Homes shall apply for an annual fire inspection by filling out the inspection request and paying the inspection fee at the City of Surprise Cashier's Office.
2. During the first 5 days of September, the fire code official will provide the City of Surprise Finance Department Revenue Manager the list of all Assisted Living Homes with completed inspections.

[A] 107.6 Carbon dioxide gas detection and alarm systems. CO2 detection and alarm systems shall be inspected at installation and annually thereafter.

Exception:

1. CO2 detection and alarm systems shall be inspected immediately after any repair or equipment replacement and every 12 months thereafter.
2. CO2 detection and alarm systems following manufacturers' specifications on testing frequency.

[A] 109.1 Board of appeals established. ~~In order to hear and decide appeals of orders, decisions or determinations made by the fire code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The fire code official shall be an ex officio member of said board but shall not have a 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. Appeals shall be in accordance with the Surprise Municipal Code.~~

[A] 109.3 Qualifications. ~~The board of appeals shall consist of members who are~~

qualified by experience and training to pass on matters pertaining to hazards of fire, explosions, hazardous conditions or fire protection systems, and are not employees of the jurisdiction.

[A] 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 *fire code official*, or of a permit or certificate used under provisions of this code, shall be guilty of a civil or criminal violation and could result in civil judgement or referral for a Class 1 misdemeanor charge. , ~~punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense~~

111.4.1 Absence of the owner. If the *owner*, the owner's authorized agent, operator or occupant of a building or premises is absent:

1. When deemed necessary by the *fire code official*, emergency measures may be taken to provide for security of the property and its contents. The cost of such action shall be borne by the property *owner* or responsible party.
2. Upon notification by the *fire code official*, the *owner* or the owner's authorized agent, operator, or occupant may be required to provide for ongoing security of the property.

111.4.2 Emergency Abatement. When deemed necessary by the *fire code official*, emergency abatement measures shall be taken to provide for public safety, security and rapid mitigation of hazards to a property and its contents. When any resources, services, special equipment and/or materials are required for abatement, and these are not available onsite, the *owner*, owner's authorized agent or responsible party shall have a written agreement with a resource provider for the accessibility and use of the services, special equipment and materials sufficient to ensure rapid response and timely abatement.

114.1 When required. A *Fire Watch* shall be provided as follows:

1. When required by other sections of this code.
2. When the *fire code official* deems it is essential for public safety.
3. When the duty fire battalion chief determines that conditions may result in a *rekindle*.

114.2 Financial responsibility. The property *owner*, the tenant, operator or the occupant in control of the premises shall be responsible for the cost of providing a *fire watch*.

114.3 Requirements. Personnel assigned *fire watch* duties shall possess the following minimum qualifications:

1. Shall be at least 18 years of age.
2. Shall be able to speak, read and understand English.
3. Shall be capable of operating a mobile telephone or portable radio, or both.
4. Provide assistance with evacuation of people present in the area.
5. Continue fire watch until properly relieved or when the *fire code official* terminates the *fire watch* activity.
6. Personnel shall not be assigned or perform additional duties which impacts their fire watch tours.
7. Assigned personnel shall be trained in the use of portable fire extinguishers.

SECTION 202 GENERAL DEFINITIONS

ASSISTED LIVING CENTER. An assisted living facility that provides resident rooms or residential units to eleven or more residents.

ASSISTED LIVING FACILITY. A residential care institution, including adult foster care, that provides or contracts to provide supervisory care services, personal care services or directed care services on a continuing basis.

ASSISTED LIVING HOME. An assisted living facility that provides resident rooms to ten or fewer residents.

ATTENDANT. A person knowledgeable in the used of portable fire extinguishers, whose duty it is to maintain fire safety measures during public or private events.

AUTOMATED EXTERNAL DEFIBRILLATOR (AED). An automated external defibrillator (AED) is a portable automatic device used to restore normal heart rhythm to patients in cardiac arrest.

BEHAVIORAL HEALTH AND DEVELOPMENTALLY DISABLED GROUP HOMES. Residential housing which serves six or less developmentally disabled and/or behavioral health residents, and is licensed by the State of Arizona Department of Health Services.

CLASS A SIGNAL BOOSTER. A signal booster is considered to be 'Class A' when it has no passbands exceeding 75 kHz. Signals from these signal boosters are designed to transmit on one or more specific channels.

CLASS B SIGNAL BOOSTER. A signal booster is considered to be 'Class B' when it has passbands that exceed 75 kHz. These signal boosters are designed specifically to

re-transmit signals within a wide frequency band. These boosters shall be registered with the FCC.

COLLAPSE ZONE. The area around the perimeter of a building that could contain debris if the building collapsed. Minimum established perimeter distance is:

1. Buildings not exceeding 35 feet in height – collapse zone is 30 feet.
2. Buildings exceeding 35 feet in height – collapse zone is 60 feet.

FIRE EQUIPMENT ROOM (FER). The Fire Equipment Room shall be located within the building footprint and have direct exterior access. The fire equipment room shall be used for only fire protection equipment and controls consisting of:

1. Fire sprinkler riser assembly
2. Fire alarm control panel
3. Fire alarm manual pull station
4. Spare sprinklers storage cabinet
5. Documentation cabinet labeled 'System Record Documents'

FIRE FIGHTER AIR REPLENISHMENT SYSTEM (FARS). A permanently installed arrangement of piping, valves, fittings and equipment to facilitate the replenishment of breathing air in self-contained breathing apparatus (SCBA) for fire fighters engaged in emergency operations.

FAMILY FOSTER HOME AND FOSTER GROUP HOME. Residential housing licensed by the State of Arizona Department of Economic Security.

HOSE LAY. The maximum length of hand held fire hose extended from the fire apparatus 150 feet (45 720 mm) around the perimeter of a building to the furthest point.

LIFE SAFETY EVALUATION REPORT. A written review dealing with the adequacy of life safety features relative to fire, extreme weather conditions, building collapse, crowd behavior, and other related safety considerations.

MAZE. A network of paths to confuse persons in the passage from an entry point to an exit point for the purpose of entertainment and/or competition.

MODIFIED NFPA 13D SPRINKLER SYSTEM. In addition to NFPA 13D requirements, sprinkler heads shall be installed in bathrooms, closet areas containing any electrical or mechanical equipment, areas under interior stairs or landings, foyers, enclosed patios and porches, hidden spaces, attics, spaces under egress stairways, and in garages. A one-inch (25 mm) domestic water meter is required.

MODIFIED NFPA 13R SPRINKLER SYSTEM. In addition to NFPA 13R requirements, sprinkler heads shall be installed in bathrooms, closet areas containing any electrical or

mechanical equipment, areas under interior stairs or landings, foyers, enclosed patios and porches, hidden spaces, attics, spaces under egress stairways, and in garages. A one-inch (25 mm) domestic water meter is required.

[BG] Institutional Group I-1. Institutional Group I-1 occupancy shall include buildings, or structures portions thereof for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions indicated below. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living center
- Assisted living facilities
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Residential board and custodial care facilities
- Social rehabilitation facilities

[BG] Residential Group R-4. Residential Group R-4 shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive custodial care. Buildings of Group R-4 shall be classified as one of the occupancy conditions indicated below. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living center
- Assisted living facilities
- Assisted living home
- Congregate care facilities
- Group homes
- Halfway houses
- Residential board and care facilities
- Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in the *International Building Code*.

Exception:

1. Family Foster Homes and Foster Group Homes licensed by the State of Arizona Department of Economic Security.
2. Group Homes for the Developmentally Disabled and Behavioral Health Group Homes (BHGH), which serve six or less residents and are licensed by the State of Arizona Department of Health Services.

SKY LANTERN. An unmanned device with a fuel source that incorporates an open flame in order to make the device airborne that is either tethered or released. Also known as but not limited to Kongming Lantern, Wish Lantern, Sky Candle, Fire Balloon

SPECULATIVE WAREHOUSE SHELL. Any type of shell building being designed for group occupancy F, group occupancy M or group occupancy S that is being constructed by an owner and/or developer for unknown tenant(s) at the time of application for a building permit shall be considered a speculative warehouse shell.

308.1.4 Open-flame cooking devices. Charcoal burners and other open-flame cooking devices shall not be operated on combustible balconies or within 10 feet (3048 mm) of combustible construction.

Exceptions:

1. One- and two-family *dwelling*s.
2. Where buildings, balconies and decks are protected by an *automatic sprinkler system*.
3. LP-gas cooking devices having LP-gas container with a water capacity not greater than 2 / pounds [nominal 1 pound (0.454 kg) LP-gas capacity].
4. Approved stationary fuel-fired barbecues complying with the following:
 - a. Permitted installation based on *approved* construction plans.
 - b. Used in accordance with the manufacturer's instruction.
 - c. Equipment designed for the fuel being utilized.

308.1.6.3 Sky lanterns. A person shall not utilize an open flame, tether, release or cause to be released an untethered a sky lantern.

308.1.8 Flaming food and beverage preparation. The preparation of flaming foods or beverages shall be limited only to places of assembly and drinking or dining establishments with an *approved* automatic sprinkler system. Preparation and serving shall be in accordance with Sections 308.1.8.1 through 308.1.8.5.

308.3 Group A occupancies. Open-flame devices shall not be used in a Group A occupancy.

Exceptions:

1. Open-flame device use shall be limited to Group A occupancy premises which have an approved fire sprinkler system and fire alarm system.
2. Open-flame devices are allowed to be used in the following situations, provided that *approved* precautions are taken to prevent ignition of a combustible material or injury to occupants:
 - 2.1. Where necessary for ceremonial or religious purposes in accordance with Section 308.1.7.
 - 2.2. On stages and platforms as a necessary part of a performance in accordance with Section 308.3.2.
 - 2.3. Where candles on tables are securely supported on substantial noncombustible bases and the candle flames are protected.
3. Heat-producing equipment complying with Chapter 6 and the *International Mechanical Code*.
4. Gas lights are allowed to be used provided that adequate precautions satisfactory to the *fire code official* are taken to prevent ignition of combustible materials.

308.3.2 Theatrical performances. Where *approved*, an open-flame device used by a performer or in conjunction with theatrical performances is allowed where adequate safety precautions have been taken in accordance with NFPA 160.

308.3.2.1 Audience control. The audience shall be at least 30 feet (9144 mm) away from the closest projection of an open flame device. Audience control shall be established by use of a physical barrier which can be easily moved or removed in the event of an emergency and shall remain in place throughout the entire performance.

308.3.2.2 Attendant. Performances involving open-flame devices shall have a person knowledgeable in the proper use of fire extinguishers assigned as an attendant. Each attendant will watch over no more than two (2) active flame devices. Attendants shall remain at the performance until all flames are extinguished and the attendant is dismissed

308.3.2.3 Clearance from combustibles. A 30-foot (9144 mm) safe zone in all directions from the open-flame device shall be established maintaining clearance from all combustibles.

314.4 Vehicles. Liquid-fueled or gaseous-fueled or electric vehicles, boats or other motorcraft shall only be located in an indoor garage except as follows:

1. Batteries are disconnected 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, boats or other motorcraft equipment are not fueled or defueled whenever they are placed within the building.
5. Automobile dealerships designated showroom.

315.4.3 Stacking. Method of stacking shall be solid piles in an orderly array.

315.4.4 Separation from buildings. Outside storage of combustible materials or combustible waste shall not be located within 20 feet (6096 mm) of a building.

Exception: Commercial and municipal trash receptacles.

315.4.5 Size of pile footprint. Solid piles shall not exceed 20 feet (6096 mm) in width by 150 feet (45 700 mm) in length.

315.4.6 Aisles width. Aisles shall be a minimum of 26 feet (7925 mm) wide and shall be maintained clear and unobstructed at all times.

315.4.7 Dead ends. No dead-end aisles shall be allowed within the facility

315.4.8 Fire hydrants and fire-flow. The minimum number of fire hydrants and fire-flow shall be based on the square footage of the combined total approved solid piles of storage. The maximum spacing between fire hydrants shall not exceed 350 feet.

315.4.9 Additional equipment. A reliable means of rotating the combustible materials shall be readily available on the property at all times (for example, pallet jack, front end loader or back hoe with bucket).

315.4.10 Clearance from ignition source. No heating equipment, including salamanders, braziers, portable heaters and other open fires, shall be located or used in the storage area. Potential sources of ignition such as hot work; warming or open fires and heating devices shall not be allowed within 30 feet (9144 mm) of storage piles.

SECTION 316

HAZARDS TO FIRE FIGHTERS FIRE PERSONNEL

316.3 Pitfalls.

The intentional design or *alteration* of buildings to disable, injure, maim or kill intruders is prohibited. A person shall not install and use firearms, sharp or pointed objects, razor wire, *explosives*, flammable or *combustible liquid* containers, or dispensers containing highly toxic, toxic, irritant or other hazardous materials in a manner that could passively or actively disable, injure, maim or kill:

1. A fire fighter who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance ; or
2. A fire code official who enters a building or premise for the purpose of conducting inspections, or to perform the duties authorized by this code.

401.9 Fire or emergency alarm initiation. No person shall silence a fire or emergency alarm system, alarm-initiating device or component until the fire department arrives.

401.10 Monitoring stations. Monitoring stations shall immediately notify the fire department of alarm signals initiated by manual fire alarm boxes, automatic fire detectors, water flow from the automatic sprinkler system or actuation of other fire extinguishing or detection systems or equipment. The monitoring station shall notify the fire department of an alarm signal at the same time as or prior to contacting the subscriber.

403.5 Group E occupancies. *An approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group E occupancies and for buildings containing both a Group E occupancy and an atrium. Group E occupancies shall comply with Sections 403.5.1 through 403.5.3. ~~403.5.4.~~

403.5.4 Fire Safety and Evacuation Plan. An approved fire safety and evacuation plan shall be submitted in an electronic PDF format to the fire code official for each school located within the City of Surprise on an annual basis prior to the first emergency evacuation drill of each school year.

403.7.1.1 Plans and diagrams. In addition to the requirements of Section 404 and Section 407.6, plans and diagrams shall be provided in an electronic PDF format to the *fire code official* and maintained in approved on-site locations indicating the approximate plan for each area, the amount and type of HPM stored, handled and used, locations of shutoff valves for HPM supply piping, emergency telephone locations and locations of exits.

403.12.1 Fire watch personnel. Where, in the opinion of the *fire code official*, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the *owner*, agent or lessee shall provide one or more fire watch personnel, as required and *approved*. Fire watch personnel shall comply with Sections 403.12.1.1 and 403.12.1.2. Such fire watch personnel shall not be required or permitted to perform other duties while on duty, other than those specified in this section or as required by the fire code official.

403.10.3 Group R-4 occupancies. *An approved* fire safety and evacuation plan in accordance with Section 404 shall be prepared and maintained for Group R-4 occupancies. Group R-4 occupancies shall comply with Sections 403.10.3.1 through 403.10.3.6. ~~403.10.3.7.~~

403.10.3.7 Fire inspections. *Fire Code Official* shall conduct a fire inspection of the premise on an annual basis and upon change of business ownership.

503.1.2.1. Maximum distance. If the hose lay distance measured from the fire apparatus to the farthest point on the building exceeds 150 feet (45 720 mm), additional fire apparatus access is required.

503.1.2.2. One- or two-family residential developments. Residential developments where the number of dwellings units exceed 30 shall provide two geographically separated unrestricted fire apparatus accesses from the public way and roads by complying with Appendix section D107.2.

503.1.2.2.1 Fire access. For the purposes of this code requirement the two types fire apparatus access is defined as:

- 1. Unrestricted fire apparatus access - entry is achieved by both right turn and left turn into the development from a public way or road.**
- 2. Restricted fire apparatus access – entry is achieved by right only turn from a public way or road.**

503.1.2.3 Multiple-family residential developments. Residential high density, as defined by the Surprise Unified Code, Section 122-52 where the number of dwelling units exceed 100 shall provide two unrestricted fire apparatus access from the public way and roads by complying with Appendix section D106.3.

Exception: The *fire code official* has the authority to require a third fire apparatus access which shall be restricted fire apparatus access.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 26 feet (7925 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 15 feet from grade (4572 mm).

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be as specified by AASHTO SU-40. ~~determined by the fire code official.~~

503.2.5 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) in length shall be provided with an *approved* area for turning around fire apparatus.

503.2.7 Grade. The grade of the fire apparatus access road shall be within the limits established by the *fire code official* based on the fire department's apparatus no more than a maximum of 10 percent.

Exception: The grade for fire apparatus access turnarounds shall have a maximum of 4 percent.

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

Exception: Fire apparatus roads serving only Occupancy Group R-3 are required to have signs and red painted curbs installed when the road width is 20 feet (6096 mm) or less.

503.3.1 Fire lane sign. Fire lane signs shall be placed every 75 feet (22860 mm) and starting 15 feet (4572 mm) from street corners and intersections.

1. Signs shall be attached to an approved stationary pole, set in concrete at a minimum depth of 18 inches (457 mm).
2. The bottom of the sign shall be 7 feet (2137 mm) above grade.
3. Signs shall be plainly visible at all times and unobstructed with a minimum of 3 foot (914 mm) clearance along line of sight.
4. The signs shall face oncoming traffic.

503.3.2 Fire lane no parking-fire lane stencil. NO PARKING-FIRE LANE shall be spaced equal distance between the fire lanes no parking signs.

1. The curb shall be painted red with white lettering.
2. Lettering shall be a minimum of 3 inches (76mm) high with ½ inch (13 mm) brush stroke.

503.6 Security gates. The installation and location of security gates across a fire apparatus access road shall be *approved* by the *fire code official*. Where security gates are installed, they shall be electric with battery backup, and shall be provided with electronic preemption equipment, controls, electronic Knox key switch and manual release mechanism approved by the fire code official. ~~an approved means of emergency operation.~~ The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, ~~where provided~~, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200

Exceptions:

1. Where approved by the *fire code official*, manually operated gates and barricades may be used. They shall be installed with Knox Padlock and approved by the *fire code official*.
2. Construction site gates shall be manually operated and secured with the construction company's padlock. During construction operations, the gate shall be kept open at all times.
3. Fire apparatus access road serving three or fewer Occupancy Group R-3 one- and two-family dwellings.

503.6.1 Existing security gates. Existing gates at entry points into gated communities shall be electric with battery backup, and shall be provided with electronic preemption equipment, controls, electronic Knox key switch and manual release mechanism approved by the *fire code official*.

503.6.2 Gates setback. Minimum set back from the public way shall be 40 feet to allow fire apparatus the ability to safely operate the gate access.

503.6.3 Gate clear width. Clear width of the roadway shall be a minimum of 20 feet (6096 mm) clear width at all entrance gates. Exit Only roadways shall be a minimum of 20 feet (6096 mm) clear width at all exit gates, unless otherwise required by the *fire code official*.

503.6.3.1 Exit only swing gates. Exit only swing gates shall be posted with a sign, 'Caution Gate Opens Out' and the pavement shall be painted with a 5 inch (127 mm) wide yellow strip showing the depth of the gate swing.

503.6.3.2 Turning radius. Gates shall be designed and installed so that the minimum turning radius of AASHTO SU-40 standard is not interfered with or obstructed by gate operations.

503.6.4 Location of access controls. The control pedestal shall be located on the approach (ingress) side of the gate and be located and designed for easy activation by the operator without leaving the vehicle. The height of the control box shall be 66 inches (1676 mm) measured from the finished grade.

503.6.5 Gate opening timing. Gates shall fully open within 15 seconds of activation and remain open until closed by operation of the control device.

503.6.6 Secondary fire apparatus access. In addition to the primary gates, secondary fire apparatus access gates, when required by the *fire code official*, shall be installed for additional emergency access and the *fire code official* must

approve the location and installation.

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

505.1.1 Commercial and public building or site address. Commercial and public building's address shall be a minimum of 12 inches (305 mm) high with a minimum stroke width of 3 inches (76 mm) on contrasting color, and clearly visible from the fire apparatus access road. The building address shall be internally or externally illuminated during hours of darkness.

Exception: For buildings located more than 100 feet from the public way centerline, the address shall be a minimum of 15 inches (381 mm) high with a minimum stroke width of 4 inches (102 mm) on contrasting color, and clearly visible from the fire apparatus access road. The building address shall be internally or externally illuminated during hours of darkness.

505.1.1.1 Multiple address location. Commercial and public buildings with multiple fire apparatus access points shall provide the address at each access point meeting the requirements of 505.1.1.

505.1.1.2 Multiple buildings with single street address. Each building shall display the alphabetic or numerical designation which shall be a minimum 18 inches (457 mm) high with a minimum 3 inch (76 mm) brush stroke on contrasting color. The building designation shall be visible from the fire apparatus access road. Where buildings have multiple fire apparatus access points, additional building designations shall be provided at each access point meeting the requirements of 5.5.1.1.

505.1.1.3 Unit or apartment numbers. Each unit or apartment shall have a numeric designation on or over the front door and rear door. The number shall be a minimum of 4 inches (102 mm) high with a minimum 3/8^{ths} inch (9.52 mm) brush stroke on a contrasting background.

505.1.1.4 Multi-unit address numbers. Adjacent to the building identification, spread numbers shall be provided to indicate the apartment or unit numbers by floors in the building. Spread numbers shall be a minimum of 7 inches (178 mm) high with a 1 inch (25 mm) brush stroke on contrasting background. They shall be

internally or externally illuminated during hours of darkness.

505.1.1.4.1 Multi-unit address signs. Spread plates shall be required on properties containing any one of the following:

1. For unit identification at building entrances where more than one dwelling or unit is accessed from a single entrance.
2. For residential unit identification at each unit cluster for residential high density rental complexes.

505.1.1.5 Multi-tenant buildings. Individual tenant spaces shall have their business name and address or suite identification posted on a building directory at the front and rear building entrance. The building directory shall be kept current at all times.

505.1.2 Site address Directory. Where required, an approved address directory shall be provided at sites containing one of the following:

1. More than one principal building.
2. Multiple buildings with unit identification numbers randomly sequenced.
3. Residential high density rental complexes.
4. Sites where there is a *fire code official* determination that emergency response may be delayed due to the physical layout of the site.

505.1.2.1 Dimensions. The site address directory minimum dimensions are determined by the number of buildings:

1. For complexes with a 12 or fewer buildings, shall have a minimum dimension of 3 by 3 feet (914 by 914 mm) site directory.
2. For complexes with 13 to 30 buildings shall have a minimum dimension 4 by 4 feet (1219 by 1219 mm) site directory.
3. For complexes with greater than 30 buildings shall have a minimum dimension of 5 by 5 feet (1524 by 1524 mm) site directory.
4. The site address directory frame shall not encroach upon the site address directory face by more than 1 ½ inches (38 mm).

505.1.2.3 Site address directory depiction. All depictions must be clear, easily understood and legible at a distance of eight (8) feet. The directory shall depict structures, building numbers, units, apartment space numbers, tennis courts, swimming pools, canals, waterfronts, driveways, streets, laundry rooms, fire hydrants, fire apparatus access road and other features as determined by the *fire code official*. The depictions shall comply with the following:

1. Directories shall be provided at all fire apparatus access entry points for all multiple dwelling developments, mobile home parks, or when required by the Fire Chief. Such directories shall be illuminated and conformed to the City of Surprise design standards, and be approved by the *fire code official*.
2. The name and address of the complex is required, but shall not exceed ten percent of the total size of the site directory.
3. Swimming pools, canals, and waterway areas shall be translucent blue.
4. Tennis courts shall be translucent green.
5. Fire hydrants shall be 1/4th inch (6.35 mm) diameter black circle filled with a translucent yellow center. The abbreviation "FH" must be affixed by the location of the fire hydrant on the directory.
6. The directory shall be properly oriented to the viewer with a red symbol one inch in diameter, with the words "You Are Here" affixed at the appropriate location on the directory.
7. There must be a north directional arrow affixed to the directory. This arrow must be a minimum of three (3) inches in size.
8. Interior fire apparatus access roads shall be marked on the address.

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or firefighting purposes, the *fire code official* is authorized to require a key box to be installed in an *approved* location. The key box shall be an approved Knox Box of an approved type listed in accordance with UL 1037, and shall contain keys to gain necessary access as required by the *fire code official*.

506.1.1 Key box. Key Box shall be either a Knox Box for less than 10 keys or a Knox Vault for 10 or more keys. The Knox Box shall be recessed mounted with the top of the box not exceeding 60 inches (1524 mm) above finished grade

~~506.1.1~~ 506.1.2 Locks. An ~~approved~~ Knox Padlocks shall be installed on manual gates or similar barriers where required by the *fire code official*

506.1.2 506.1.3 Key boxes for none standardized fire service elevator keys. Key boxes provided for none standardized fire service elevator keys shall comply with Section 506.1 and all of the following:

506.1.4 Swimming pool gates. All pedestrian gates in residential and commercial occupancies that provide access to swimming pools open to the public or controlled by Home Owner Associations shall have Knox Box mounted near the gate with a key providing access. If a card reader or fob system is used,

a Knox Box with a toggle switch shall be installed.

507.1 Required water supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises prior to combustibles being stored on site upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. Where property is subdivided with or without the creation of public or private streets for the express purpose of providing said subdivided parcels for sale or otherwise permitting separate and/or individual development to occur, an approved water supply capable of supplying the projected fire flow for fire protection shall be provided and extended to serve directly any and all subdivided properties. The projected fire flow will be based on the greatest potential demand posed by any type of occupancy allowed by zoning laws on the proposed property. Required water supply shall not be interrupted, for any reason, without prior approval of the fire code official.

507.2.1 Private fire service mains. Private fire service mains and appurtenances shall be sized to accommodate the calculated fire flow but shall not be less than 6 inches (152 mm) in diameter. Dead-end fire mains shall be prohibited. Installation shall be installed in accordance with NFPA 24.

507.2.1.1 Fire service main use. Once a private fire service main has been approved and placed in operation, tapping into the fire service main for other than for fire control purposes is prohibited.

Exception: A written request shall be submitted to fire code official for approval to tap into a fire main for other than fire control purposes.

507.2.1.2 Fire hydrant maintenance and flushing. All fire hydrants shall be flushed and serviced and maintained annually in accordance with NFPA 25 and the American Water Works Association- Manual of Water Supply Practices, Installation Field Testing and Maintenance of Fire hydrants.

507.3.1 Exterior storage. When there is exterior storage of combustible or hazardous materials, the required fire flow to protect that exterior storage shall be determined by engineering analysis. If the fire flow required for the exterior storage exceeds the fire flow required to protect the building, the higher fire flow shall be used and provided.

1. The engineering analysis shall be included and submitted with the water flow test summary report to the fire code official.
2. A site plan showing the showing the exterior storage layout in relation to fire apparatus access road(s) and fire hydrants shall be submitted to the fire code official.

507.4.1 Water flow test. A water flow test shall be conducted for all new construction or for fire sprinkler installation in existing buildings which previously did not have a sprinkler system. With assistance from the water company, the fire code official shall determine the number of fire hydrants to be tested in accordance with test procedures outlined

in the American Water Works Association Manual of Water Supply Practices, Distribution System Requirements for Fire Protection, AWWA M31. Results of the testing shall be provided to the fire department in an electronic format acceptable to the fire code official.

507.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an *approved* route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the *fire code official*.

Exceptions:

1. ~~For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m) shall have NFPA 13R or NFPA 13D sprinklers installed.~~
2. ~~For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the distance requirement shall be 600 feet (183 m).~~

507.5.1.2 R-3 high density developments. The distance between fire hydrants shall not exceed 350 feet (106 680) with group R-3 occupancy dwelling units.

Exception: The distance between fire hydrants shall not exceed 500 feet (152 400 mm) when the group R-3 occupancy dwelling units with fire sprinkler systems.

510.1 Emergency responder radio coverage in new buildings. New buildings shall have *approved* radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. This section shall not require improvement of the existing public safety communication systems. The requirements of Section 510 shall apply to all buildings and structures that satisfy any one of the following characteristics:

1. Buildings or structures that exceed 3 stories above finished grade;
2. The total building area is 10,000 square feet (929 0304 m²) or more;
3. One story below grade with an area of 5,000 square feet (464 5152 m²);
4. Where radio coverage signal strength levels are not consistent with minimum signal strength level requirement in Section 510.4.1.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.12.2 shall be permitted to be installed or maintained instead of an *approved* radio coverage system.

2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated emergency responder radio coverage system.
4. Building or structures greater than 10,000 square feet (929 0304 m²) which has a certificate of coverage provided, which certificate is based upon testing performed by a RF Engineer approved by the *fire code official*.
5. Buildings or structures which has a certificate of coverage provided, which certificate is based upon testing performed by a RF Engineer approved by the *fire code official*.
6. Residential occupancy group R-3 one- and two-family dwellings.

510.1.1 ERRC on-site location. The emergency responder radio coverage Bi-Directional Amplifier (BDA), battery backup system and annunciator panel shall be located either in the fire equipment room or the building IDF room.

1. The room housing ERRC equipment shall be separated from the rest of the building by 2 hour rated fire barriers.
2. There shall be an 'ERRC' approved sign on the door for the room with ERRC equipment.

510.1.2 Obstruction by new buildings or structures. No obstruction of the emergency responder radio coverage system backhaul shall be allowed without an approved mitigation plan. When the construction of a new building obstructs line of sight emergency radio communications to existing buildings or other locations, the developer of the new building shall develop an approved mitigating plan to correct the degraded radio coverage as necessary to restore communications capabilities in accordance with Section 510.

510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with radio coverage for emergency responders as required in Chapter 11 and which is approved by the *fire code official*. Existing buildings without approved radio coverage, as determined by the *fire code official*, 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 or designated representatives 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.

Exception: Building or structures greater than 10,000 square feet (929 0304 m²) that have a certificate of coverage provided, which certificate is based upon testing performed by a RF Engineer approved by the *fire code official*.

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 ordinances and regulations as determined by the *fire code official*.

510.3.2 Plans. Radio coverage system plans shall be submitted for review and approval prior to installation. Coordination and compliance with Regional Wireless Cooperative (RWC) radio system requirements and *the Code* is the responsibility of the owner and contractor.

510.3.2.1 Submittal process. At time of plan submittal, the owner, contractor and designer for a new building or occupancy may choose one of the following options;

1. Install an emergency responder radio coverage system during construction per current code and standards.
2. Install a shell emergency responder radio coverage system backbone in accordance with requirements and procedures as determined by the *fire code official*.
3. Upon completion of the building have a current FCC General Radio Operator License (GROL) RF Engineer perform a radio signal test and provide a certificate of compliance and/or retrofit into the areas where the building failed to meet minimum adequate signal strength requirements.

510.3.2.1 Submittal process. Plans shall follow the same approval process as other fire protection plans. See sections 105.4.2.1.1 and 105.4.2.1.2.

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

1. 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.
2. A roof plan showing the location of antenna(s) including a line of site plan to agency transmitting and receiving antenna(s).
3. Schematic drawings of the electrical system, backup power, antenna system and other associated equipment.

4. Rack and equipment cabinet plans showing arrangement and configuration of emergency responder radio coverage system equipment.
5. System riser diagram(s).

510.3.2.3 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.

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have acceptable emergency responder communications enhancement system coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

Exceptions:

The following critical areas shall be provided with 99 percent of floor area radio coverage:

1. Fire command center(s)
2. Fire equipment room
3. Fire pump room
4. Elevator lobby
5. Interior exit stairways
6. Exit passageways
7. Standpipe locations
8. Rescue air filling stations
9. Sprinkler sectional valve locations
10. As required by the fire code official.

510.4.2 System design. The emergency responder radio coverage system shall be designed in accordance with Sections 510.4.2.1 through ~~510.4.2.8~~ 510.4.2.9, NFPA 1221 and UL2524.

510.4.2.1 Amplification systems and components.

Buildings and structures that cannot support the required level of radio coverage shall be equipped with Class A channelized public-safety grade signal boosters designed for the bands and frequencies covered by Regional Wireless Cooperative (RWC) and specified by the fire code official, and to systems and components to enhance the public safety radio signals and achieve the required level of radio coverage specified in Sections 510.4.1 through 510.4.1.3. Public safety communications enhancement systems utilizing radio-frequency-emitting

devices and cabling shall be approved by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.

Exception: Where approved by the fire code official, a Class B signal booster may be installed.

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

510.4.2.3.1 Emergency power off. The UPS system shall be equipped with an emergency power off (EPO) switch in a location *approved by the fire code official*. The EPO shall disconnect both the circuit breaker and secondary power supply simultaneously.

510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association (NEMA) 4-type waterproof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet.
3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.
4. ~~Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions..~~

Where a donor antenna exists:

- a. Isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.
- b. There shall be only one donor antenna for a building
- c. Commercial repeater/DAS system shall not be co-located with Public Safety ERRC system.
5. Bi-Directional Amplifiers (BDAs) used in emergency responder radio coverage systems shall have oscillation prevention circuitry.
6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any emergency responder

radio coverage networks shall be coordinated and approved by the *fire code official*.

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:

1. Loss of normal AC power supply.
2. System battery charger(s) failure.
3. Malfunction of the donor antenna(s).
5. Failure of active RF-emitting device(s).
6. Low-battery capacity at 70-percent reduction of operating capacity.
7. Failure of critical system components.
8. The communications link between the *fire alarm system* and the emergency responder radio enhancement system.

510.4.2.9 Building conduit and pathway Survivability.

The system design shall provide pathway survivability in accordance with 2016 NFPA 72 Section 24.3.13.8 and NFPA 1221 Section 9.6.2.

510.4.2.9.1 Conduit and cable. All new buildings shall be constructed with not less than a 2 inch (51 mm) conduit having a minimum 2 hour fire rating installed between the ground floor or the bottom of the lowest floor below grade to the roof.

Exception: In existing buildings, riser cable mechanically protected by metal conduit can be routed through a sprinkler-protected, 1-hour rated enclosure, including the door.

1. Installed riser cable shall be protected by a 2 hour rated enclosure.
2. Feeder cables shall be either protected by an automatic sprinkler system in accordance with 2016 NFPA 13 or installed within metal raceway.
3. Radio cables (riser and feeder) shall be plenum rated.
4. Only shielded cables that do not interfere with radio signals may be comingled with the radio cables.
5. Each floor shall have access to the conduit in either the form of a drop ceiling or access panels. The access shall be marked on 'As Built' plans.

510.5.2 Minimum qualifications of personnel. The minimum qualifications of the system designer, ~~and lead installation personnel~~ and personnel conducting emergency responder radio coverage tests and certification shall ~~include both of the following have possession of:~~

1. A valid FCC-issued General Radio Operators License (GROL).
2. Certification of in-building system training issued by: ~~an approved organization or approved school, or a certificate issued by the manufacturer of the equipment being installed.~~
 - a. Associated Public Safety Communications Officials (APCO)
 - b. Personal Communications Industry Association (PCIA)
 - c. Land Mobile Radio manufacturers, or
 - d. the manufacturer of the equipment being installed.

All design documents and all tests and inspections shall be documented and signed by a person meeting the minimum qualifications noted in this section.
~~These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the fire code official is provided.~~

604.3.2 Electrical service shut off access. Where electrical service shut off controls are located inside a building, a door providing direct access from the exterior to the room containing such electrical shut off controls shall be provided, when required by fire code official.

607.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of the *International Mechanical Code* and NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. _

607.3.3.3.2 Certificate of inspection. A certificate of inspection/service shall be electronically forwarded to City of Surprise Fire-Medical Department within fifteen (15) days after completion of the six-month service, or upon service rendered after the activation of any fire suppression system. The submission of the certificate of inspection service is the responsibility of the contractor performing the service. The certificate shall include:

1. The name, address and phone number of the licensed contractor performing the service;
2. The name, address and phone number of the business for whom the service is being done;
3. Date and time of the service;
4. Provide description of entire exhaust system;
5. The cleanliness of the hood and associated appliances;

6. A detailed list of all work completed on the system;
7. State standard to which the hood system was cleaned;
8. Document any areas that were not cleaned and the reason why;
9. Specific date of the previous service on the system;
10. Alterations to the system or appliances that causes the system to be out of compliance with the manufacturer's specifications.

805.5 Group E classroom. The requirements in Sections 805.5.1 through 805.1.2 shall apply to classroom furniture.

1. The placement of and use of this furniture in classrooms shall be approved.
2. The facility manager shall maintain a record of all furniture.

805.5.1 Upholstered furniture. Newly introduced upholstered furniture shall meet the requirements of Sections 805.5.1.1 through 805.5.1.3.

805.5.1.1 Ignition by cigarettes. Newly introduced upholstered furniture shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with one of the following:

1. Mocked-up composites of the upholstered furniture shall have a char length not exceeding 1.5 inches (38 mm) when tested in accordance with NFPA 261.
2. The components of the upholstered furniture shall meet the requirements in accordance with NFPA 260.

805.5.1.2 Heat release rate. Newly introduced upholstered furniture shall have limited rates of heat release when tested in accordance with ASTM E1537 or California Technical Bulletin 133, as follows:

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 80 kW.
2. The total heat released by the single upholstered furniture item during the first 10 minutes of the test shall not exceed 25 megajoules (MJ).

805.5.1.3 Identification. Upholstered furniture shall bear the label of an approved agency, confirming compliance with the requirements of Sections 805.5.1.1 and 805.5.1.2.

807.2 Combustible decorative materials. In Groups A, B, E, I, M and R-1 and in dormitories in Group R-2, curtains, draperies, fabric hangings and other similar

combustible decorative materials suspended from walls or ceilings shall comply with Section 807.3 and shall not exceed 10 percent of the specific wall or ceiling area to which such materials are attached. Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered to be *interior finish*, shall comply with Section 803 and shall not be considered *decorative materials* or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.15 of the *International Building Code*.
2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
3. In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.3 and shall not be limited.
4. The 10-percent limit shall not apply to curtains, draperies, fabric hangings and similar combustible decorative materials used as window coverings.
5. In Group E occupancies, no combustible decorative material including streamers, banners, artwork and teaching materials may be suspended from the ceiling.

807.5.2 Group E. Group E occupancies shall comply with Sections 807.5.2.1 through 807.5.2.3.

807.5.2.2 Artwork in corridors. Artwork and teaching materials shall be limited on the walls of *corridors* to not more than 20 percent of the wall area. The artwork shall not exceed 1/4th inch (6 mm) thickness and will be affixed to the wall at four corners.

Exceptions:

1. Seasonal and cultural artwork specially prepared may be displayed for a maximum of 2 weeks, after which the artwork will be stored or sent home with the students.
2. Hallway alcoves leading into classrooms shall be free of artwork and teaching materials.

3. Combustible artwork which is three dimensional shall not be affixed to corridor walls.

807.5.2.3 Artwork in classrooms. Artwork and teaching materials shall be limited on walls of classrooms to not more than 50 percent of the specific wall area to which they are attached.

1. When the whiteboard or bulletin has teaching material or artwork on them, they shall be considered part of the 50 percent all area.
2. The artwork shall not exceed 1/4th inch (6 mm) thickness and will be affixed to the wall at four corners.

Exception: Combustible artwork which is three dimensional shall not be affixed to classroom walls.

807.5.2.4 Combustibles by classroom exit doors. A clear area of 36 inches (914 mm) shall be maintained around classroom doors.

1. No combustible material of any type may be placed within the clear area.
2. The clear area may not be obstructed in any way.
3. Classroom exit doors may not have any artwork, posters, and flags, pendants, teaching materials or any decorations on the door.

Exceptions:

1. Lockdown security curtain may be hung and will be kept rolled-up except during lockdown.
2. The emergency plan, fire exit map and signs about health matters shall be posted next to the door.
3. Teacher's name and grade level may be placed on the hallway side of the door.

808.5 Wastebaskets and other waste containers in Group E occupancy.

Wastebaskets and other waste containers, including their lids shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid.

808.5.1 Location. Wastebaskets and other waste containers, including their lids shall be located outside the 36 inch (914 mm) unobstructed clear area around the classroom exit door.

901.2.1 Fire pre-incident Plan Part of the construction plans set is the

901.2.1.1 SITE PLAN. From the below list of items, provide only the items which apply to this construction document:

1. Fire line with hydrant locations
2. Post Indicator Valve (PIV) and/or OS&Y valve locations
3. Gas line and Gas shutoff location
4. Water cutoff valves for potable and fire
5. Generator location & fuel type
6. Fire pump location
7. Knox Box locations
8. Standpipe locations
9. FDC location
10. Building Construction Type
11. Building roof type
12. Building height
13. Building Square Footage
14. Location of address directories
15. Fire apparatus access
16. Fire lanes
17. Gates (automatic or manual)

901.2.1.2 FLOOR PLAN. From the below list of items, provide only the items which apply to this construction document:

1. Room identifiers
2. Building Electrical panel locations
3. Building Electrical Main panel & building power cutoff location
4. Roof access location
5. CO2 bulk storage location
6. High Hazard Storage location
7. Fire alarm control panel location
8. Fire annunciator panel locations
9. Fire sprinkler riser assembly location

10. Other specialized Fire Protection Systems identifiers and location
11. AED station locations
12. MSDM and Emergency Plans location
13. Designated Emergency Egress locations
14. Occupancy Groups
15. Occupancy Load

901.4 Installation. *Fire protection systems* shall be maintained in accordance with the original installation standards for that system. Required systems shall be extended, altered or augmented as necessary to maintain and continue protection where the building is altered, remodeled or added to. *Alterations to fire protection systems* shall be done in accordance with applicable standards.

1. The fire sprinkler riser and standpipes shall be installed in an *approved* enclosed room within the building or structure footprint.
2. The fire alarm control panel shall be located in a controlled environment that meets the manufacturer's temperature requirements.

Exception: A NFPA 13R or 13D riser may be installed in the building wall with external access port.

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

901.4.6.1 Access. ~~Automatic sprinkler system risers, fire pumps and controllers shall be provided with ready access. Where located in a fire pump room or automatic sprinkler system riser room, the door shall be permitted to be locked provided that the key is available at all times~~ Fire pump, fire equipment and automatic sprinkler system riser rooms shall be readily accessible from the exterior of the building near a fire apparatus access road.

1. Fire equipment and automatic sprinkler system riser rooms shall have a 36 inches (914 mm) wide exterior door for direct access from the exterior.
2. The fire pump room shall be provided with doors and unobstructed passageways large enough to allow removal of the largest piece of equipment.

901.4.6.2 Marking on access doors. ~~Access doors for automatic sprinkler system riser rooms and fire pump rooms shall be labeled 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 7/16 inch (10 mm). Access doors for the fire protection equipment shall be labeled with an approved sign.~~

901.4.6.2.1 Fire equipment room sign. The approved sign shall have white reflective lettering and red non-reflective vinyl background with the following detail:

1. The sign plate shall be 12 inches (305 mm) by 12 inches (305 mm) with a thickness of .080 aluminum construction and 1 1/2 inch (38 mm) radius corners.
2. Font style is Handel Gothic capital or similar fonts.
3. Top centered on the sign face shall be 'F.A.C.P.' in 2 1/2 inch (64 mm) lettering and 1/2 inch (13 mm) stroke.
4. Middle center of the sign face shall be 'RISER' and beneath it 'ROOM' in 2 inch (51 mm) lettering and 3/8 inch (10 mm) stroke.
5. Bottom of the sign face shall be 'STORAGE PROHIBITED' in 11/16 inch (17 mm) lettering and 1/8 inch (3 mm) stroke.

901.4.6.2.2 Automatic sprinkler system riser room sign. The approved sign shall have white reflective lettering and red non-reflective vinyl background with the following detail:

1. The sign plate shall be 12 inches (305 mm) by 12 inches (305 mm) with a thickness of .080 aluminum construction and 1 1/2 inch (38 mm) radius corners.
2. Font style is Handel Gothic capital or similar fonts.
3. Top third centered on the sign face shall be 'FIRE DEPT.' in 1 1/2 inch (38 mm) lettering and 3/8 inch (10 mm) stroke.
4. Middle third center of the sign face shall be 'SPRINKLER' in 1 1/2 inch (38 mm) lettering and 3/8 inch (10 mm) stroke.
5. Bottom third center of the sign face shall be 'RISER RM.' in 1 1/2 inch (38 mm) lettering and 3/8 inch (10 mm) stroke.
6. Bottom of sign face shall be 'STORAGE PROHIBITED' in 11/16 inch (17 mm) lettering and 1/8 inch (3 mm) stroke.

901.4.6.2.3 Fire Pump room sign. The approved sign shall have white reflective lettering and red non-reflective vinyl background with the following detail:

1. The sign plate shall be 12 inches (305 mm) by 12 inches (305 mm) with a thickness of .080 aluminum construction and 1 ½ inch (38 mm) radius corners.
2. Font style is Handel Gothic capital or similar fonts.
3. Top centered on the sign face shall be 'FIRE PUMP.' in 2 inch (51 mm) lettering and 3/8 inch (10 mm) stroke.
4. Middle third center of the sign face shall be 'ROOM' in 2 inch (51 mm) lettering and 3/8 inch (10 mm) stroke.
5. Bottom of sign face shall be 'STORAGE PROHIBITED' in 11/16 inch (17 mm) lettering and 1/8 inch (3 mm) stroke.

901.4.6.2.5 Fire equipment and riser rooms size. The fire equipment and automatic sprinkler system riser rooms shall be used for fire protection equipment only. The Fire sprinkler riser assembly shall have 36 inches (914 mm) of minimum clearance around three sides and must have a minimum of 18 inches (457 mm) from one wall.

901.5.2 Stocking and loading. No portion of the building may be stocked or loaded with combustible regular stock, furnishings or fixtures until:

1. The automatic sprinkler system has been tested and approved.
2. When a fire alarm system is required, it shall be approved and monitored or a fire watch shall be provided prior to stocking or loading.
3. A temporary certificate of occupancy has been issued.

901.6 Inspection, testing and maintenance. Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire-extinguishing systems, smoke control 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 removed. All fire protection systems shall be inspected and tested by a contractor licensed by the State of Arizona who has a current City of Surprise business license. The contractor's service personnel shall each hold a valid certificate of qualification issued by NFPA, Underwriters Laboratories, NICET or product specific industry manufacturers. It shall be the responsibility of the owner to ensure that these requirements are met prior to any work being performed on fire protection systems.

**TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS**

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
<u>Smoke control systems</u>	<u>NFPA 92</u>
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001
Aerosol fire-extinguishing systems	NFPA 2010

901.6.3 Records. Records of all system inspection, tests, maintenance or repair required by the referenced standards shall be maintained on the premises for a minimum of three years and shall be electronically copied to the fire code official. All individuals/businesses performing inspection, tests, maintenance, and/or repair on any fire protection system shall electronically forward itemized reports of such work to the fire code official within 15 business days of the work performed. Reports required to be electronically copied or filed pursuant to this section shall be filed as directed by the Fire-Medical Department, which direction may include filing using software of a third-party.

901.6.3.2 Inspection and testing tags. Upon completion of inspections and testing of fire protection systems, a tag shall be attached to the system in a conspicuous location. The tag shall document the date of the inspection or test, the name of the qualified contractor company, the name of the qualified individual performing the inspection or tests, the contact telephone numbers for both the contractor and individual, and shall indicate each deficiency found or that no deficiencies were found.

901.8.3 Removal of fire protection system's equipment. No fire suppression, fire detection, fire appliance or fire alarm equipment will be removed from existing approved systems without obtaining a permit prior to commencing any work.

Exception: Fire suppression equipment that is being removed for purposes of maintenance, repair or like-for-like replacement shall comply with Section 901.7.

903.1.2 Inspectors' test valve. The Inspectors' Test Valve shall be located at the end of the most distant sprinkler pipe on each story and shall be equipped with a readily accessible brass shutoff valve and signage.

903.2 Where required. ~~Approved automatic sprinkler systems~~ in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12. All new buildings and structures shall be provided with *Approved automatic sprinkler systems* as described in Sections 903.2.1 through 903.2.12.

Exception:

1. One- and two-family dwellings with adequate water supply for use of the fire protection service to suppress building and structure fires.
2. Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 711 of the *International Building Code*, or both.
3. Detached gazebos, Ramada's, bathroom buildings, guardhouses and utility vaults.
4. Detached non-combustible covered parking not exceeding 5,000 square feet (464 5152 m²) with a minimum of 26 feet (7925 mm) separation between covered structures.

Exception:

Covered parking for RV and Boats shall have sprinkler systems.

5. Detached non-combustible, non-occupied water supply booster pump and pool equipment structures with smoke/heat detection and external audio and visual notification appliances.

903.2.1 Group A. An *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies. ~~as provided in this section~~

903.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided throughout stories containing Group A-1 occupancies and throughout all stories from the Group A-1 occupancy to and including the levels of exit discharge serving that occupancy. ~~where one of the following conditions exists:~~

- ~~1. The *fire area* exceeds 12,000 square feet (1115 m²).~~
- ~~2. The *fire area* has an *occupant load* of 300 or more.~~
- ~~3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.~~
- ~~4. The *fire area* contains a multiple theater complex.~~

903.2.1.2 Group A-2. An *automatic sprinkler system* shall be provided throughout stories containing Group A-2 occupancies and throughout all stories from the Group A-2 occupancy to and including the levels of exit discharge serving that occupancy. ~~where one of the following conditions exists:~~

- ~~1. The *fire area* exceeds 5,000 square feet (464 m²).~~
- ~~2. The *fire area* has an *occupant load* of 100 or more.~~
- ~~3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.~~

903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided throughout stories containing Group A-3 occupancies and throughout all stories from the Group A-3 occupancy to and including the levels of exit discharge serving that occupancy. ~~where one of the following conditions exists:~~

- ~~1. The *fire area* exceeds 12,000 square feet (1115 m²).~~
- ~~2. The *fire area* has an *occupant load* of 300 or more.~~
- ~~3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.~~

903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided throughout stories containing Group A-4 occupancies and throughout all stories from the Group A-4 occupancy to and including the levels of exit discharge serving that occupancy. ~~where one of the following conditions exists:~~

- ~~1. The *fire area* exceeds 12,000 square feet (1115 m²).~~
- ~~2. The *fire area* has an *occupant load* of 300 or more.~~
- ~~3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.~~

903.2.1.5 Group A-5. An *automatic sprinkler system* shall be provided for all enclosed Group A-5 accessory use areas. ~~in excess of 1000 square feet (93 m²).~~

903.2.1.5.1 Spaces under grandstands or bleachers. Enclosed spaces under *grandstands* or *bleachers* shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1. ~~where either of the following exist:~~

- ~~1. The enclosed area is 1000 square feet (93 m²) or less and is not constructed in accordance with Section 1029.1.1.1.~~
- ~~2. The enclosed area exceeds 1000 square feet (93 m²).~~

903.2.1.7 Multiple fire areas. An *automatic sprinkler system* shall be provided where

multiple fire areas of Group A-1, A-2, A-3 or A-4 occupancies share exit or *exit access* components. ~~and the combined occupant load of these fire areas is 300 or more.~~

903.2.2 Ambulatory care facilities. An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility. ~~where either of the following conditions exist at any time:~~

- ~~1. Four or more care recipients are incapable of self-preservation.~~
- ~~2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility. In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor as well as all floors below where such care is provided, and all floors between the level of ambulatory care and the nearest level of exit discharge, the level of exit discharge, and all floors below the level of exit discharge.~~

Exception: Floors classified as an open parking garage are not required to be sprinklered.

903.2.3 Group E. An *automatic sprinkler system* shall be provided for Group E occupancy. as follows:

- ~~1. Throughout all Group E fire areas greater than 12,000 square feet (1115 m²) 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.~~

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

- ~~1. A Group F-1 fire area exceeds 12,000 square feet (1115 m²).~~
- ~~2. A Group F-1 fire area is located more than three stories above grade plane.~~
- ~~3. The combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).~~
- ~~4. A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).~~

903.2.4.1 Woodworking operations. An *automatic sprinkler system* shall be provided throughout all Group F-1 occupancy *fire areas* that contain woodworking operations ~~in~~

excess of 2,500 square feet (232 m²) or in any area that generates finely divided combustible waste or uses finely divided combustible materials-

903.2.5.3 Pyroxylin plastics. An automatic sprinkler system shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 20 POUNDS (9 071 KG) ~~100 pounds (45 kg)~~.

903.2.6 Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I fire area.

Exceptions:

- ~~1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1, Condition 1 facilities.~~
- ~~2. An automatic sprinkler system is not required where Group I-4 day care facilities are at the level of exit discharge and where every room where care is provided has not fewer than one exterior exit door.~~
- ~~3. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the level of exit discharge and all floors below the level of exit discharge other than areas classified as an open parking garage.~~

903.2.8.1 Group R-3. An *automatic sprinkler system* installed in accordance with Section 903.3.1.3 shall be ~~permitted~~ provided in Group R-3 occupancies where there is the lack of adequate water supply for the use of the fire protection service to protect buildings and structures from an exterior fire source or to suppress structure fires within the wildland-urban interface area of the City of Surprise.

903.2.8.1.1 One- and two-family dwellings in areas without adequate water supply. Dwellings shall have approved automatic sprinkler systems.

Exceptions:

1. Dwellings not exceeding 3,600 square feet (334 m²) has a fire flow of 1000 gallons per minute (63.1 L/s) for a minimum duration of 30 minutes.
2. Dwellings in excess of 3,600 square feet (334 m²) have a fire flow of 1500 gallons per minute (95 L/s) for a minimum duration of 30 minutes.

903.2.8.4.1 Residential Group R-4. Modified NFPA 13D sprinkler system shall be required to be installed in accordance with section 903.3.1.3. If any portion of a patio has habitable space directly above the patio, all of the patio ceiling shall be equipped

with sprinkler protection. Such system shall consist of an electronically supervised valve located between the domestic water riser control valve and the sprinklers, and shall be equipped with an electronically supervised water-flow switch and monitored by an approved monitoring, and shall sound an alarm at a constantly attended location inside the facility. The minimum listed electronic components for the alarm system shall consist of:

1. Auto Dialer
2. Primary and secondary phone line or wireless digital alarm communications transmitter with primary and secondary communications ports.
3. Interior horn-strobe and exterior horn-strobe connected to the fire sprinkler riser water-flow switch.
4. Interconnected smoke alarms.
5. Carbon monoxide devices with distinctive signal which is different from the smoke alarm signal.

Exceptions:

1. Family foster homes and foster group homes licensed by the State of Arizona Department of Economic Security.
2. Behavioral Health Group Homes (BHG) which when serves six or fewer residents and is licensed by the State of Arizona Department of Health Services.

903.2.8.5 Special requirements for Group R-1 and R-2. Sprinklers shall be installed in bathrooms and closet areas containing any electrical or mechanical equipment, foyers, and attached garages, accessible areas under interior stairs or landings, exterior balconies and covered patios or landings which have habitable space directly above the balconies, patio or porch. In living spaces, sprinklers shall be the concealed type. For the purpose of inspection, testing, or maintenance, there shall be provided, at the time of construction, an exterior access door providing direct access to the fire sprinkler riser. The door shall be of adequate size to allow for valves and gauges to be accessed, repaired and viewed from the exterior for testing and maintenance purposes. The dimensions of the access door will depend on the design of the fire riser, controls and gauges. When necessary, access shall be provided through private dwellings or garages so service personnel can maintain the fire sprinkler riser and equipment.

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

- ~~1. A Group S-1 fire area exceeds 12,000 square feet (1115 m).~~
- ~~2. A Group S-1 fire area is located more than three stories above grade plane.~~
- ~~3. The combined area of all Group S-1 fire areas on all floors, including any~~

~~mezzanines, exceeds 24,000 square feet (2230 m).~~

~~4. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m).~~

~~5. A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m).~~

903.2.9.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406.8 of the *International Building Code*, as shown:

~~1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m).~~

~~2. Buildings not more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m).~~

~~3. Buildings with repair garages servicing vehicles parked in basements.~~

~~4. A Group S-1 fire area used for the repair of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m).~~

903.2.9.2 Bulk storage of tires. Buildings and structures where the area is used for the storage of tires exceeds ~~20,000 cubic feet (566 m)~~ 5000 cubic feet (141,584 m³) be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1

903.2.9.3 Speculative use warehouse. Where the occupant, tenant, use of the building, the storage commodity has not been determined, the building is a speculative shell warehouse, the automatic sprinkler system shall be designed and installed based upon high hazard commodity in accordance with the following:

1. The design area shall not be less than 2000 square feet (185 806 m²).
2. The density shall not be less than that of class IV commodities with 20 percent expanded group A plastics, and aisle width of a minimum of 8 feet (2 438 mm) and 20 feet (6 096).

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

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

2. A room or space where sprinklers are considered undesirable because of the nature of the contents, where *approved by the fire code official*.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a *fire-resistance rating* of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents, where approved by the fire code official.
5. Fire service access elevator machine rooms and machinery spaces.
6. 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*.

903.3.1.1.3 Mercantile and Industrial shade canopies.- Industrial shade canopies shall be protected by an automatic sprinkler system.

Exceptions:

1. Detached awnings and shade canopies that do not exceed 2000 square feet (185 m²) in area.
2. Detached industrial shade canopies and awnings that are made of noncombustible material with a flame spread index no greater than 25 when tested in accordance with ASME E84 which does not exceed 2000 square feet (185 m²).
3. Where a slatted, lattice or louvered awnings or canopy roof system is 50 percent or more open to the sky.
4. Noncombustible shaded walkway or pedestrian entry area.

903.3.1.1.4 Nonresidential shade canopies.- Nonresidential awnings, canopies and patio covers shall be protected by an automatic sprinkler system.

Exceptions:

1. Awnings, canopies and patio covers that do not exceed 400 square feet (37 m²)
2. Detached awnings and shade canopies that do not exceed 2000 square feet (185 m²) in area.
3. Detached industrial shade canopies and awnings that are made of noncombustible material with a flame spread index no greater than 25 when tested in accordance with ASME E84 which does not exceed 2000 square feet (185 m²).
4. Where a slatted, lattice or louvered awnings or canopy roof system is 50 percent or more open to the sky.

5. Awnings, canopies and patio covers that are made of noncombustible material with a flame spread index no greater than 25 when tested in accordance with ASME E84 that is used for covering play-ground equipment.
6. Noncombustible shaded walkway or pedestrian entry area.

907.1.1.1 Professional registrant activities. For fire alarm systems and other code regulated alarm systems, the following are considered to be professional registrant activities in accordance with the requirements of the Arizona Board of Technical Registration:

1. Determine the system type.
2. Determine the applicable codes and standards and appropriate engineering practices.
3. Determine device types and locations.
4. Prepare generalized riser diagram.
5. Coordinate and interface with other systems.
6. Develop system specifications.

Exceptions:

1. Where the modification of fire alarm systems does not require mathematical calculations or hazard analysis.
2. Where items 1-6 are addressed in a stamped narrative or the fire alarm shop drawings are prepared by a NICET Level 3 or 4.

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 full area smoke detection coverage in accordance with Section 907.2.8.2 and occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code. 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 water-flow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

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

the manual fire alarm box shall not be located in an area that is open to the public.

907.2.17.1 Smoke detectors. All new buildings shall have full smoke detection coverage to include ~~Not fewer than one smoke detector listed for the intended purpose shall be installed~~ in all of the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.

907.5.2.3 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.5.2.3.1 through 907.5.2.3.3.

Exceptions:

1. Visible alarm notification appliances are ~~not~~ required in *alterations*, ~~except~~ where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in *exits* as defined in Chapter 2.
3. Visible alarm notification appliances shall not be required in elevator cars.
4. Visual alarm notification appliances are not required in critical care areas of Group I-2, Condition 2 occupancies that are in compliance with Section 907.2.6, Exception 2.
5. Visible alarm notification appliances shall be required in all employee work areas except when the public use and common use area visible notification appliance can be seen with the employee work area door closed.

907.6.6.3 Automatic test signal. The generation of an automatic weekly test signal shall be required from each subscriber alarm system to the subscriber monitoring station.

1. The monitoring station shall verify the receipt of the test signal.
2. The monitoring station shall notify its subscriber if an automatic weekly test signal has not been received.

907.6.6.4 Multi-tenant buildings with different addresses. The alarm monitoring station shall identify all addresses of buildings, floors or suites protected by a fire protection system and be able to provide this information to Phoenix Alarm Center, any first responder and/or the fire code official.

912.1 Installation. Fire department connections shall be installed in accordance with the NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.7.

912.1.1 Siamese connection or splitter. The fire department connection pipe shall be a Siamese connection.

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be *approved* by the *fire code official*.

912.2.1 Wall mounted fire department connection. The fire department connection center height shall not be less than 24 inches (610 mm) nor greater than 48 inches (1 219 mm) above finished grade. There shall be a fire hydrant located within 100 feet based on hose lay.

912.2.2 Remote standalone fire department connection. The remote fire department connection 24 inches (610 mm) nor greater than 48 inches (1 219 mm) above finished grade. There shall be a fire hydrant located within 25 feet based on hose lay.

912.3 Fire hose threads. Fire hose threads used in connection with fire department connection shall be two 2½ inch (63.5 mm) National Standard Threads (NST).

912.5 FDC Signs. The sign shall be a 12x12 inches (305x305 mm) red reflective sign face with white lettering on an aluminum sign plate. The lettering shall be:

1. Top line – F.D.C. using 3 inch x ½ inch (76 mm x 13 mm) Handel Gothic capital fonts.
2. Bottom line – Address using 2 inch x ½ inch (51mm x 13 mm) Handel Gothic capital fonts.

912.5.1 Sign location. The sign shall facing the fire apparatus access road and shall be unobstructed.

1. The top of the wall mounted FDC sign shall be 7 feet (2134 mm) above finished grade.
2. The remote standalone FDC sign shall be secured at the highest point of the pipe.

918.1 Scope. The design, installation, and maintenance of *fire fighter replenishment systems (FARS)* shall be in accordance with this section.

918.2 Required installations. Effective 60 calendar days after the approval of this code, *fire fighter replenishment systems (FARS)* shall be installed in the following existing buildings, as well as any building constructed thereafter that fall within these

categories:

1. Buildings classified as high-rise in accordance with the building code.
2. Underground structures that are two or more floors below grade with an area greater than 10,000 square feet (929 m²).

918.3 Construction documents and contractor qualifications. Construction documents and contractor qualifications shall be submitted prior to any fire fighter replenishment systems (FARS) installation related work being commenced.

918.3.1 Plans. A minimum of two sets of plans, specifications and manufacturer's documentation shall be submitted to City of Surprise Community Development, Development Services Building Permit Resource Center for reviews and approvals. The plans shall demonstrate compliance with the requirements of this section and Appendix L. Calculations shall be prepared by a registered professional engineer demonstrating that the design criteria for pressure containing components is satisfied with an additional minimum safety factor of 25 percent.

The plan submittal package shall include specifications for tubing, fittings, and manufacturer data sheets for valves, pressure regulators, pressure relief devices, gauges, Rapid Intervention Crew (RIC) universal air connections and cylinder filling hoses.

918.3.2 Contractor qualification. The fire fighter replenishment systems (FARS) shall be installed by an Arizona State licensed contractor. Proof of licensure shall be provided with the plan submittal.

918.4 Design criteria. The system shall be designed to fill at each interior cylinder filling panel, one 66 standard cubic foot compressed breathing air cylinder to a maximum pressure of 4,500 psig (31 028 kPa).

1. The filling operation shall be completed in not more than two minutes upon connection of the cylinder to the fill hose.
2. The minimum design flow of the breathing piping system shall be calculated using two interior cylinder filling panels operating simultaneously and located at the highest level above the most remote location from the base station exterior fire department connection panel and enclosure base.

918.5 Operating pressure. All components used in the system shall be rated to operate at a minimum pressure of 5,000 psig (34 475 kPa) at 70 degree Fahrenheit (21 Celsius).

918.6 Marking. System piping, gauges, valves and air outlets shall be clearly marked by means of steel or plastic labels or tags indicating their function.

1. Marking used for piping systems shall consist of the content's name and include a direction of flow arrow.
2. Markings shall be provided at each valve, at wall, floor or ceiling penetrations, at each change of direction, and at a minimum of every 20 feet (6096 mm) or fraction thereof throughout the piping system.

918.7 Base station exterior fire department connection panel and enclosure.

918.7.1 Location. The fire department connection panel shall be attached to the building or on a remote monument at the exterior of the building.

1. The panel shall be secured inside of a weather-resistant enclosure.
2. The panel shall be within 50 feet (15 240 mm) of an approved roadway or driveway, or other location approved by the *fire code official*.
3. The enclosure shall be visible and accessible on approach to the building.

918.7.2 Construction. The fire department connection panel shall be installed in a cabinet constructed of minimum 18 gauge carbon steel. When constructed of steel, the cabinet shall be provided with a coating to protect the cabinet from corrosion. When constructed of nonmetallic material, the cabinet shall be resistant to ultraviolet and infrared solar radiation.

918.7.3 Vehicle protection. When the fire department connection panel is located in an area subject to vehicular traffic, impact protection shall be provided in accordance with this code.

918.7.4 Base station enclosure marking. The front of the cabinet shall be marked 'FIREFIGHTER AIR SYSTEM' on securely attached steel, plastic engraved or painted plate. The lettering shall be in contrasting color with the cabinet front and in letters that are a minimum of 2 inches (51 mm) high with 3/8-inch (5 mm) brush stroke. The marking of the cabinet shall be unobstructed.

918.7.5 Base station components. The components in the base station panel shall consist of all necessary components to provide air to the air substations located on upper and/or lower building levels. The fire department air supply source shall be designed to connect to the base station panel. The following components shall be installed in the base station enclosure.

1. One male Rapid Intervention Crew (RIC) Universal Air Connection (UAC) fitting. When connected to a female fitting, the assembled UAC shall meet the construction, performance and dimensional requirements of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services 2007 Edition.
2. One downstream shutoff valve.

3. One pressure gauge to check pressure of the piping distribution to air substations located on upper and lower building levels.
4. One pressure relief valve designed for 1.25 times the design discharge of the fire department air supply or air supply trucks. All fittings, hoses and hard piping in the base station supply panel and distribution piping to air substations supply panels shall be designed for an air pressure of 1.5 times the pressure of the fire department air delivery system.
5. Base station can be designed for an air pressure supply piping system for supply of air to air distribution. The air supply lines will require an intermediate regulator to provide air pressure for a 5,000 psi (34 473 kPa), for a 4.5 air pack system. The air supply lines will be fitted with separate pressure relief valves set at 1.25 times the working pressure of the air supply line and the operating pressure of the pressurized lines.
6. The relief valve, piping, pressure regulator, pressure gauges, fittings and connection hoses shall meet the requirement of the ASME Boiler and Pressure Code, 7 Section VIII, Unified Pressure Vessel Code. The installation of the piping system, as a minimum, will be based on ASME B31.3-2012.
7. Mechanical supports for piping, hoses, gauges and pressure components, will be designed and built to provide a solid rigid structure.

918.7.6 Security. The base station cabinet shall have a locking mechanism to prevent tampering with the system. The fire department connection panel cabinet shall remain locked at all times except for maintenance, testing, inspection or use by approved personnel.

918.7.7 Knox box. An approved Knox box shall be installed adjacent to the fire department connection panel cabinet. A key to the cabinet shall be placed in the Knox box.

918.8 Interior cylinder fill panels – air substation.

918.8.1 Location. Cylinder fill panels shall be installed in the interior of the building as follows:

Aboveground structure. An interior air substation cylinder fill panel and enclosure shall be installed on floor landings. In buildings classified as high-rise. In all stairwells regardless of height of the buildings commencing on the second floor landing above grade, below grade and every other floor thereafter.

Underground structure. An interior air substation cylinder fill panel and enclosure shall be installed in all stairwells on the floor landing on the third level below grade and every other below-grade level thereafter. Each panel

shall be located a minimum of 36 inches (914 mm) but not more than 60 inches (1524 mm) above the finished floor on the stairway landing.

918.8.2 Cabinet requirements. Each air substation cylinder fill panel shall be installed in a cabinet constructed of minimum 18 gauge carbon steel. The depth of the cabinet shall not create an exit obstruction when installed in building stairways. All components, with the exception of the shutoff valve, pressure gauges, fill hoses and ancillary components, shall be contained behind a minimum 18 gauge interior panel.

918.8.3 Cabinet door. The cabinet door hinges shall be located inside the cabinet. The opening of the door shall not reduce the required exit width or create an obstruction in the path of egress. A minimum of 80 percent of the door surface area shall be constructed of tempered glass. The thickness of the glass shall not be greater than 1/8 inch (3.17 mm).

918.8.4 Cabinet marking. The front of the cabinet shall be marked 'FIREFIGHTER AIR SYSTEM' on securely attached steel, plastic engraved or painted plate. The lettering shall be in contrasting color with the cabinet front and in letters that are a minimum of 2 inches (51 mm) high with 3/8-inch (5 mm) brush stroke. The marking of the cabinet shall be unobstructed.

918.8.5 Air substation components. The cabinet shall be of sufficient size to allow for installation of the following components:

1. One isolation valve located between the air discharge line to the next substation and downstream line to the air base station supply or the air substation immediately below to the next substation above the air base station.
2. The fill hoses and isolation valves shall be installed between the air bottle connection line and the fresh air supply.
3. Excess bleed valves shall be located between the air bottle fill hose and the next air substation.
4. Four SCBA fill hoses are required at each single air substation, the air supply lines shall be identified as 4,500 psig (31 028 kPa) pressure and shall be controlled by a single valve between the air supply and air bottle. The SCBA fill hoses shall be designed with RIC UAC fittings. Protective cap shall be provided for each hose.

918.8.6 Cylinder filling hose. The cabinet design shall provide a means for storing the hose to prevent kinking. When the hose is coiled, the brackets shall be installed so that the hose bend radius is maintained at 4 inches (102 mm) or greater. The discharge outlet of each cylinder filling hose shall have a female RIC UAC. The female fitting shall be designed to connect to a male RIC UAC. The assembled RIC UAC shall meet the construction, performance and dimensional requirements of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing

Apparatus for Fire and Emergency Services 2007 Edition.

918.8.7 Security. To prevent tampering and unauthorized access to the system, each panel shall remain locked by an approved means.

918.9 Installation of components

918.9.1 Pressure monitoring switch. An electric low-pressure monitoring switch shall be installed in the piping system to monitor the air pressure. The pressure switch shall be connected to the building's fire alarm system. The pressure switch shall transmit a supervisory signal when the pressure of the breathing air system is less than 3,000 psig (20 685 kPa) at 70 degree Fahrenheit (21 Celsius). A weather resistant sign shall be placed adjacent to the notification appliance stating 'FIREFIGHTER AIR SYSTEM – LOW AIR PRESSURE ALARM'. The lettering shall be in contrasting color with the cabinet front and in letters that are a minimum of 2 inches (51 mm) high with 3/8-inch (5 mm) brush stroke.

918.9.2 Tubing. Piping shall be constructed of stainless steel or other approved materials that are compatible with breathing air. The use of nonmetallic materials shall be compatible with breathing air. When stainless steel tubing is used, it shall meet ASTM A-269, Grade 316 or an equal standard. Stainless steel fitting shall be Grade 316 and a minimum 0.375 inch (9.5 mm) outside diameter by .065 inch (1.6 mm) wall Grade 316 fully annealed seamless. Stainless steel fittings shall be at least Grade 316 and meet the requirements of ASTM A 479 or equal. Routing of tubing and bends shall be such as to protect the tubing from mechanical damage.

918.9.3 Support. Piping shall be supported at maximum intervals of 60 inches (1524 mm). Individual tubing clamps and mounting components shall be mechanically secured to the building support members in accordance with the manufacturer's specifications.

918.9.4 Fittings. Fittings shall be constructed of stainless steel or other materials that are compatible with breathing air. The use of nonmetallic materials shall be compatible with breathing air. Stainless steel fittings shall be at least Grade 316 and meet the requirements of ASTM A 479 or an equal standard.

918.9.5 Prohibition. The use of carbon steel, iron pipe, malleable iron, high-strength gray iron or alloy steel is prohibited.

918.10 System assembly requirements. The system shall be welded except where the tubing joints are readily accessible and at the individual air fill panels. When mechanical high-pressure tube fittings are used, they shall be approved for type of materials to be joined and rated for maximum pressure of the system. Welding procedures shall meet ASME B31.1-2010, Part 4 and Chapter V (Exhibit VI). Prior to and during the welding of sections of tubing, a continuous, regulated dry nitrogen or argon purge at 3 psig (20.68 kPa) shall be maintained to eliminate contamination with products of the oxidation or welding flux. The purge shall commence a minimum of 2

minutes prior to welding operations and continue until the welded joint is an ambient temperature between 60 degree and 80 degree Fahrenheit (15.5 and 26.6 Celsius).

918.11 Prevention of contamination. The installing contractor shall ensure that, at all times, the system components are not exposed to contaminants, including, but not limited to, oils, solvents, dirt and construction materials. When contamination of system components has occurred, the effected component shall not be installed in the system.

918.12 Testing and inspection.

918.12.1 Testing. Following fabrication, assembly, and installation of the piping distribution system, exterior connection panel and interior cylinder fill panels, the fire code official shall witness the pneumatic testing of the complete system at a minimum test pressure of 5,500 psi (37 923 kPa) using oil-free dry air, nitrogen or argon. A minimum 24 hour pneumatic or hydrostatic test shall be performed. During this test all fittings, joints and system components shall be inspected for leaks. A solution compatible with the system component materials shall be used on each joint and fitting. Any defects in the system or leaks detected shall be documented on an inspection report, repaired or replaced. As an alternate, a pressure decay test in accordance with ASME B31.3 is allowed. A test of the low-pressure monitoring switch shall be performed. Each air fill panel shall be tested for compatibility with the SFMD SCBA RIC UAC. The pipe or tubing manufacturer mill report shall be provided to SFMD.

918.12.2 Air samples. A minimum of two samples shall be taken from separate air fill panels and submitted to an independent certified gas analysis laboratory to verify the system's cleanliness and that the air is certified as breathing air. The laboratory shall submit a written report, of the analysis documenting that the breathing air complies with this section, to the fire code official.

918.12.3 Quality analysis. During the period of quality analysis, the air fill panel inlet shall be secured so that no air can be introduced into the system and each air fill panel shall be provided with a sign stating "AIR QUALITY ANALYSIS IN PROGRESS, DO NOT FILL OR USE ANY AIR FROM THIS SYSTEM BY ORDER OF THE FIRE MARSHAL". This sign shall be a minimum of 8 ½ by 11 inches (215mm by 279 mm) with a minimum of 1 inch (25 mm) lettering.

918.12.4 Inspection. At a minimum, annually the breathing air within the system shall be inspected and an air sample shall be taken and certified as breathing air. The laboratory test results shall be made provided to the fire code official.

918.13 System acceptance and certification. As part of the Fire Final Acceptance of the air system, the building owner shall provide for the testing and certification of the system. As a minimum, this shall include:

1. The system's compatibility with the City of Surprise Fire-Medical Department (SFMD) SCBA apparatus

2. The system's ability to maintain 5,000 psi (34 475 kPa) working pressure
3. The operability of the low-pressure monitoring switch
4. That the system's air quality complies with the requirements of Section 918.12.
5. Providing written verification of testing and certification contract to the *fire code official*.

Upon satisfactory completion of all tests and verification of air quality and certification contract, the system shall be considered complete.

919.1 Scope. Increasingly, AEDs are being deployed in public facilities such as sports arenas, shopping malls, and airports, buildings housing medical and dental offices and municipal, county and state government buildings, thus potentially decreasing the time between cardiac arrest and access to defibrillation equipment. Public access defibrillation does not mean that any member of the public who witnesses an event should be able to use an AED. Public access defibrillation refers to the accessibility of the device itself. While AEDs are reasonably uncomplicated to use, the AED should be used only by persons who have received proper training and education and who have been certified by a competent authority. Persons without these basic credentials should not use the device.

919.2 Automated External Defibrillators (AED) use requirement. Use of AEDs within the City of Surprise shall meet the Arizona Revised Statute 36-2262.

Exception: Persons qualifying under Arizona Revised Statute 36-2264.

919.3 Automated External Defibrillators (AED). Only commercially available AEDs that have been cleared for marketing by the Food and Drug Administration (FDA) shall be considered for availability and use in a Public Access Defibrillation program.

919.3.1 AED prescription devices. Based on Arizona Revised Statutes public Access Defibrillation, related plans and protocols that are approved by a supervising physician are considered a prescription. Once the physician has approved and signed-off on AED selection and placement, this becomes the authorizing prescription.

919.3.2 AED response kit. An AED response kit shall be kept and maintained at each AED location. The response kit shall minimally contain:

- 1 pocket mask
- 1 set of examination glove (S,M,L,XL)
- Razor
- Scissors
- Absorbent gauze
- Hand towels

919.4 Training. Persons volunteering and designated to use AEDs shall be trained in Cardio Pulmonary Resuscitation (CPR) and the Use of the AED and Accessories. Formal refresher training shall be conducted at a minimum of every two years.

919.5 Automated External Defibrillators (AED) placement. The placement of AEDs shall be based on close proximity to the area(s) with a high volume of population density and/or areas of high-risk activities. The location shall be:

1. Easily accessible to the public and designated users
2. Secure location to minimize the potential for tampering or misuse
3. Location shall be well marked and unobstructed.

919.6 1 ½ minutes rule. In identifying and selecting the location for installing the AED, it should be centrally located by walking 1 ½ minutes in each direction of the compass. The 1 ½ minutes walking radius around the AED shall provide the maximum coverage for people volume and for high risk activities.

919.7 Inspection, testing and maintenance. As with any life safety equipment the AED shall be inspected, tested and maintained on a regular basis according to the manufacturer's recommended schedule.

1. Minimum inspection shall be monthly.
2. Minimum testing shall be quarterly.

919.8 Records. Records of each AED unit inspections, tests and maintenance shall be maintained on premise for the life of the unit.

919.8.1 Record information. Record shall include the manufacturer's name, date of purchase, unit serial number, location, dates of inspection, dates of testing and maintenance action and dates.

919.8.2 Inspection checklist. At a minimum the AED maintenance check list located on the City of Surprise Fire –Medical website shall be filled out and retained for a period of 1 year.

919.8.3 Record availability. Records shall be made available to the *fire code official* upon request.

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code.

Exception: Unless specifically indicated in this chapter, all work involving the *fire protection systems* shall meet the requirements of the current adopted fire code and standards.

1103.1 Required construction. Existing buildings shall comply with not less than the

minimum provisions specified in Table 1103.1 and as further enumerated in Sections 1103.2 through 1103.10.

The provisions of this chapter shall not be construed to allow the elimination of *fire protection systems* or a reduction in the level of fire safety provided in buildings constructed in accordance with previously adopted codes.

Exceptions:

1. Where a change in fire-resistance rating has been approved in accordance with Section 501.2 or 802.6 of the *International Existing Building Code*.
2. Group U occupancies.
3. Tenant Improvements and/or modifications that increase the building footprint or the suite footprint protected by a fire protection system by 50 percent, or a fire alarm control panel replacement shall be considered a new installation.
 - a. When the fire alarm control panel is replaced, the entire *fire alarm system* shall be brought to the current performance and installation standards in accordance with Section 907.5.

1103.2 Emergency responder radio coverage in existing buildings. Existing buildings other than Group R-3, that do not have approved radio coverage for emergency responders in the building based on existing coverage levels of the public safety communication systems, shall be equipped with such coverage according to one of the following:

1. Where an existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 510.1, Exception 1.
2. Within a time frame established by the adopting authority.
3. Buildings meeting any one of the following conditions:
 - The total building area is 10,000 square feet (929 0304 m²) or more;
 - One story below grade with an area of 2,500 square feet (232,2576 m²);
 - Where radio coverage signal strength levels are not consistent with minimum signal strength level requirement in Section 510.4.1.

Exceptions:

1. Where it is determined by the fire code official that the radio coverage system is not needed.
2. Building or structures greater than 10,000 square feet (929 0304 m²) which has a certificate of coverage provided, which certificate is based upon testing performed by a current FCC General Radio Operator License (GROL) RF Engineer who is approved by the *fire code official*
3. Buildings or structures and areas of buildings and structures that have minimum emergency responder radio coverage signal strength levels of the

Regional Wireless Cooperative (RWC) network within the building in accordance with IFC Section 510-4.1 without the use of indoor radio coverage system.

1103.4 Vertical openings. Interior vertical openings, including but not limited to stairways, elevator hoist ways, service and utility shafts, that connect two or more stories of a building, shall be enclosed or protected as specified in Sections 1103.4.1 through 1103.4.10. Modification to existing smoke control system shall be in accordance with Sections 901.6.2.1 and 901.6.2.2.

1103.5 Sprinkler systems. *An automatic sprinkler system shall be provided in existing buildings in accordance with Sections 1103.5.1 through ~~1103.5.4~~ 1103.5.8.*

1103.5.1 Group A-2. Where alcoholic beverages are consumed in a Group A-2 occupancy having an occupant load of ~~300~~ more than 50, the fire area containing the Group A-2 occupancy shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a fire alarm system in accordance with Section 907 based on current adopted fire code.

1103.5.5 Change of commodity classification. An automatic sprinkler system shall be installed when a building or part of a building, regardless of building area, undergoes an increase in commodity classification as identified in Table 3203.8 .

1103.5.6 Change of occupancy over 2,500 square feet (232 m²). An automatic sprinkler system shall be installed in any building 2,500 square feet (232 m²) or greater that undergoes a change in occupancy.

Exception: Any Occupancy Group R-3 which becomes an occupancy Group R-4 shall have automatic sprinkler system installed throughout the building and attached structures.

1103.5.7 Partially sprinklered buildings.

When existing non-sprinklered buildings of mixed occupancy are required to install sprinklers based on change of occupancy classification, the sprinklers shall be installed throughout the fire area including the new occupancy.

Exception: Where the fire-resistance rating of fire barriers and/or horizontal assemblies separating the newly sprinklered fire area and non-sprinklered fire area is a minimum of 2 hours fire wall.

1103.5.8 Expansion of original building footprint. Buildings which increase the original square footage more than 49 per cent shall have automatic sprinkler system installed throughout the building.

3103.2 Approval required. Tents and membrane structures having an area in excess of 400 square feet (37 m²) shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Tents open on all sides that comply with all of the following:
 - 2.1. Individual tents having a maximum size of 700 square feet (65 m²).
 - 2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m²) total.
 - 2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.
3. Tents and curtains or extensions attached thereto, when used for funeral services.

3103.3.2 Mazes. Mazes including, but not limited to corn stalks, hay bales or hedge mazes shall be in accordance with Section 3106.

3103.6 Construction documents. A detailed site and floor plan for tents or membrane structures with an *occupant load* of 50 or more shall be provided to the fire code official with each Temporary Use Permit (TUP) application for approval. The tent or membrane structure floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating, location of fire extinguishers, emergency lighting, illuminated exit signs, no smoking signs and location and type of heating and electrical equipment. The *construction documents* shall include an analysis of structural stability.

3201.1.1 Speculative Building. Occupancy Groups S, F and M speculative building that having an interior clear height greater than 12 feet (3658 mm) where high pile storage may accrue shall comply with this section.

3201.3.2 Approved storage layout. A floor plan, of legible size, shall be provided, mounted on a wall and protected from damage. The floor plan shall be mounted in an *approved* location and show the following:

1. Locations, dimensions and rack layout of *high-piled storage areas*.
2. Design storage height for each storage area.
3. Types of commodities.
4. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
5. Aisle dimensions between each storage array.
6. For palletized and solid-piled storage, the maximum pile volume for each storage array.
7. Location and classification of commodities in accordance with Section 3203.

8. Location of required fire department access doors.
9. Location of valves controlling the water supply of ceiling and in-rack sprinklers.
10. Design criteria of the fire sprinkler system.

3206.2.2 Group F-1 and S-1 with a storage area greater than 400,000 square feet (37 161,216 m²). When storage areas in Group F-1 and S-1 are greater than 400,000 square feet (37 161,216 m²) a Technical Report prepared by an Arizona Professional shall be submitted for review and *approval* by the *fire code official*. Additional fire protection and/or life safety systems may be required by the *fire code official*.

3206.2.3 Storage height greater than 35 feet (10 668 mm). When the designated storage height is greater than 35 feet (10 668 mm), a Technical Report shall be prepared by an Arizona Professional and shall be submitted to the *fire code official* for *approval*.

3206.2.4 Additional hose connections. Additional fire department hose connections shall be provided when required by the *fire code official*.

3206.4.1 Pallets. ~~Automatic sprinkler system requirements based on the presence of pallets shall be in accordance with NFPA 13.~~

3206.4.1 General. The design of automatic sprinkler systems for the protection of Group M and S occupancies containing high pile storage or high challenge commodities over an area equal to or greater than 2,500 ft.² (232 2576 m²) and for the protection of hazardous materials stored more than one pallet high in Group M, S or H occupancies shall be in accordance with this section. This section does not apply to miscellaneous storage within the scope of Chapter 12 of the NFPA 13, 2016 edition.

3206.4.1.2 Plan submittal requirements. See Chapter 9 Design Documents for plan submittal requirements.

3206.4.1.3 Minimum design requirements for speculative shell warehouses. The design of the automatic sprinkler system for speculative warehouses shall be based on Class A non-expanded plastic to the available storage height. The storage height shall be determined by subtracting 48 inches (1219 mm) from the highest point of the roof above each system for ESFR and 30 inches (762 mm) for area density applications.

3206.4.1.4 Minimum requirements for client leased or occupant owned warehouses. The design of an automatic sprinkler system for client leased or occupant owned buildings containing high pile storage shall be based on the requirements of NFPA 13, Chapter 12. The responsible Fire Protection Engineer shall perform a survey of the building to determine commodity classification, storage configuration, building height and other information related to the development of an appropriate sprinkler system design. The Engineer shall also make reasonable efforts to meet with the building owner or operator to understand seasonal or customer related fluctuations to the stored commodities, storage

height, and configuration. The sprinkler design shall be based on the most demanding requirements determined through the on-site survey and discussions with the building owner or operator. Technical Report shall clearly define the basis for determining the commodity and sprinkler design selection, along with how the commodities will be isolated or separated, and the referenced design document(s), including NFPA13 or the current applicable FM Global Data sheet. If a specific fire test is used as the basis of design, a copy of the fire test report shall be provided at the time of plan review.

3206.4.1.5 Required plan submittal information. All plans, hydraulic calculations and technical reports shall be submitted with the plan submittal application in conjunction with or prior to the racking plan submittal.

3206.4.1.6 Minimum plan information. In addition to the requirements of NFPA 13, Chapter 14, the information specified in 3206.4.1.6.1 and 3206.4.1.6.2 shall be included in the plans or technical report.

3206.4.1.6.1 Class I-IV and Group A plastic commodities.

1. An owner's certificate in accordance with NFPA 13. The design criteria, e.g., NFPA 13, FM Global Data Sheets, or a specific fire test report.
2. Water Flow & Pressure Test Report performed within 90 days of the plan submittal
3. The type of design, e.g. Control Mode Density/Design area Method; Suppression Mode method, including appropriate code references.
4. A description of the stored commodities and how the commodity classification was determined.
5. A layout of the proposed storage arrangement. If the storage is in racks, a plan and elevation detail illustrating rack heights, flue dimensions and arrangement. This detail is not required for speculation warehouses.
6. The aisle dimensions between each storage array.
7. If a high challenge commodity is separated using fire-resistive construction, the boundary of the fire-resistive construction shall be illustrated.
8. A data sheet for the backflow preventer. If a data sheet is not available, the design professional shall include a statement addressing the minimum required pressure loss.
9. A data sheet for each installed automatic sprinkler.
10. A data sheet for each pipe hanger used to hang or support the sprinkler piping.
11. If a fire pump will be installed or used, the manufacturer's factory test curve shall be included in the submittal.

12. A cross-section view illustrating obstructions to the ceiling sprinklers, e.g., lights, structural members, cable trays, electrical bus ducts, HVAC ductwork.

3206.4.1.6.2 Hazardous materials. In addition to the requirements of this section, the following information shall be included in a hazardous materials technical report.

1. A hazardous materials inventory statement
2. For flammable & combustible liquids, an analysis of the miscibility of Class I liquids, the size and type of the packaging, the packaging materials of construction, and if the containers have a pressure relieving mechanism.
3. For Level 2 or 3 aerosols, a statement indicating that the aerosols are in cartons or individually stored.

3206.4.1.7 Identification of sprinkler system capabilities and limitations. An adhesive label shall be permanently installed at or adjacent to each sprinkler riser. When sprinkler risers are located outside of the building, the sign shall be stamped metal. The minimum sign dimension is 6-inches high by 4-inches wide. The sign shall specify the capabilities and limitations of the automatic sprinkler system. The sign shall include the following information:

1. The design base or basis, including the edition used.
2. A statement indicating if the sprinkler design is control mode density area method, control mode specific application, suppression mode, or any combination thereof.
3. When used, all of the storage conditions stipulated NFPA 13 for Special Designs.
4. The maximum storage height e. The minimum required aisle width f. If storage is in racks, the maximum rack width and minimum transverse and longitudinal flue widths.
5. Commodities that can be protected by the automatic sprinkler system h. Commodities that cannot be protected by the automatic sprinkler system
6. Limits on storage heights of idle wood and plastic storage
7. Limits on storage heights of miscellaneous Group A plastic, tire and rolled paper storage
8. Locations where in-rack sprinklers are required.
9. Locations where horizontal and/or vertical barriers are required.

10. Information explaining the manufacturer, sprinkler identification number, k-factor, and operating temperature of the overhead sprinklers protecting the high pile storage.

3206.4.2 Pallets. *Automatic sprinkler system* requirements based on the presence of pallets shall be in accordance with NFPA 13

3206.4.12.1 Plastic pallets.

Plastic pallets *listed* and *labeled* in accordance with FM 4996 or UL 2335 shall be treated as wood pallets for determining required sprinkler protection.

5301.1 Scope. Storage, use and handling of *compressed gases* in *compressed gas* containers, cylinders, tanks and systems shall comply with this chapter and NFPA 55, including those gases regulated elsewhere in this code. Partially full *compressed gas* containers, cylinders or tanks containing residual gases shall be considered as full for the purposes of the controls required. Liquefied natural gas for use as a vehicular fuel shall also comply with NFPA 52 and NFPA 59A. *Compressed gases* classified as hazardous materials shall also comply with Chapter 50 for general requirements and chapters addressing specific hazards, including Chapters 58 (Flammable Gases), 60 (Highly Toxic and Toxic Materials), 63 (Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids) and 64 (Pyrophoric Materials). Compressed hydrogen (CH) shall also comply with the applicable portions of Chapters 23 and 58 of this code, the *International Fuel Gas Code* and NFPA 2. Cutting and welding gases shall also comply with Chapter 35.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Compressed natural gas (CNG) for use as a vehicular fuel shall comply with Chapter 23, NFPA 52 and the *International Fuel Gas Code*.
3. *Cryogenic fluids* shall comply with Chapter 55.
4. LP-gas shall comply with Chapter 61 and the *International Fuel Gas Code*
5. Insulated liquefied Carbon Dioxide systems shall comply with NFPA 55.

~~**5307.2 Ventilation.** Indoor storage and use areas and storage buildings shall be provided with ventilation in accordance with Section 5004.3. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.~~

Exceptions:

- ~~1. A gas detection system complying with Section 5307.2.1 shall be permitted in lieu of mechanical ventilation.~~
- ~~2. Areas containing insulated liquid carbon dioxide systems used in beverage~~

dispensing applications shall comply with Section 5307.3.

5307.2 General – simple asphyxiant gas systems.

Carbon dioxide and other simple asphyxiant gas systems with more than 50 pounds (22.7 kg) in use, per system shall comply with this section.

Exception: One (1) additional 50 pounds (22.7 kg) DOT 3AA cylinder of carbon dioxide may be connected to the same system provided an isolation valve is in place, and only one cylinder can be in use at a time.

5307.2.1 Gas detection system Permits. In rooms or areas not provided with ventilation in accordance with Section 5307.2, A gas detection system complying with Section 916 or, an oxygen depletion alarm system, either of which initiates audible and visible alarm signals in the room or area where sensors are installed, shall be provided require a permit as set forth in Section 105.7.11.

5307.2.1.1 Equipment. The storage, use, and handling of liquid carbon dioxide shall be in accordance with Chapter 53 and the applicable requirements of NFPA 55, Chapter 13. Insulated liquid carbon dioxide systems shall have pressure relief devices vented in accordance with NFPA 55.

5307.2.1.2 Protection from damage. Carbon dioxide and other simple asphyxiant gas systems shall be installed so the storage tanks, cylinders, piping fittings, detection and notification devices are protected from damage by occupants or equipment during normal facility operations, in accordance with Sections 5303.5 and 5303.6.

5307.2.2 Gas ventilation requirements. When any ASME vessels containing liquefied carbon dioxide and other simple asphyxiant gas or more than two 50 pound DOT AA3 gaseous carbon dioxide cylinders and other simple asphyxiant gas per system, are connected to a piping system and located within the structure, a mechanical exhaust ventilation system shall be provided in accordance with the International Mechanical Code. A separate plan submittal for the installation of this mechanical exhaust ventilation system is required.

5307.2.2.1 Exhaust. The mechanical exhaust ventilation system shall be designed at a rate not less than one cubic foot per minute, per square foot of floor area, within the area inside the structure where the ASME vessel or DOT cylinders are located. The ventilation system shall be designed to operate at a negative pressure in relation to the surrounding area.

5307.2.2.2 Exhaust intake. The exhaust intake shall be taken from a point within 12 inches (305 mm) of the floor. The exhaust system intake shall be located a minimum of 2 feet (610 mm) away from any gas detector or located on the opposite wall of any gas detector.

5307.2.2.3 Exhaust termination. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located a minimum of 10 feet (3048 mm) from property lines, a minimum of 3 feet (914 mm) above the roof line and a minimum of 10 feet (3048 mm) from operable openings into the building and a minimum of 10 feet (3048 mm) above adjoining grade.

5307.2.2.4 Automatic activation. The exhaust system shall automatically activate when:

1. The concentration of carbon dioxide reaches 3 percent ((30,000 ppm (54,000 mg/m³)), or
2. The concentration of oxygen reaches 19.5 percent in an oxygen deficient environment, or

Exception: Continuous ventilation.

5307.2.2.5 Manual activation. A manual activation switch shall be provided at the entrance of the area where the ASME vessel or DOT cylinders are located. This manual activation switch shall be red in color and be clearly marked with its function.

5307.2.3 Equipment venting. All new and existing installations, emergency relief vents, burst disks and pump vents shall be terminated outside the building and at least 10 feet (3048 mm) from openings into the building or property lines.

5307.2.4 Gas detection. Compressed gases such as Carbon Dioxide, Helium, Argon, Nitrogen and other compressed gases that are classified as an asphyxiant shall be provided with a gas detection and alarm systems. The gas detection and alarm systems shall be installed, inspected, tested, calibrated and maintained per the manufacturer's instructions.

5307.2.4.1 Gas detectors. Gas detectors shall be field tested at the time of final inspection and annually thereafter or more often if so required per the manufacturer. Testing, inspection, observation, and maintenance of detection devices shall be performed with an approved test gas. All test gas shall have a recognized certification that documents the type and percentage of gas.

5307.2.4.2 Records. Records of inspection, testing, and maintenance and observations of all gas detection, gas alarm systems, and sensor calibration shall be maintained on the premises for a minimum of three years and reports electronically provided within 15 days following inspection, test or maintenance completion. . Reports required to be electronically copied or filed pursuant to this section shall be filed as directed by the *fire code official*, which direction may include using software of a third party.

5307.2.4.3 Specific gas detection. Where the gas is carbon dioxide, the gas detection systems shall be designed to detect carbon dioxide. All other simple

asphyxiants shall use an oxygen sensor.

5307.2.4.4 Location. Gas detection shall be provided at each point of use and at vessels or cylinders inside structures. Basements and or subterranean spaces that could be physically entered and that have product lines shall have gas detection.

5307.2.4.5 Carbon dioxide two tier detection. The detection system shall be capable of two tier detection.

1. Tier one shall be set at 0.5 percent carbon dioxide or 5,000 ppm (9,000 mg/m³).
2. Tier two shall be set at 3 percent carbon dioxide or 30,000 ppm (54,000 mg/m³).

5307.2.4.6 Simple asphyxiant two tier detection. The detection system shall be capable of two tier detection.

1. Tier one shall be set at 19.5 percent oxygen in an oxygen deficient environment.
2. Tier two shall be set at 18 percent in an oxygen deficient environment.

5307.2.4.7 Installation. Asphyxiant gas detection systems or appropriate gas detection for the gas shall be installed per the manufacture's manual.

5307.2.4.8 Power. The power supply to the gas detection system shall be circuit locked and labeled. Approved backup power shall be provided.

5307.2.5 Supervisory signal. At 0.5 percent (5,000 ppm (9,000 mg/m³)) carbon dioxide or 19.5 percent oxygen, a local warning/supervisory signal with visible and audible indication shall occur at a constantly manned location and shall be transmitted off-site to a UL approved third party monitoring station as a supervisory signal alarm.

5307.2.6 Evacuation alarm. At 3 percent ((30,000 ppm (54,000 mg/m³)) carbon dioxide or 18 percent oxygen, an audio and visual evacuation alarm shall activate for the occupancy and shall transmit an alarm signal off-site to a UL approved third party monitoring station as a gas specific alarm.

Exception: When the facility does not have a system capable of transmitting signals off site then established approved protocols shall be in place to call 911 directly.

5307.2.6.1 Fire alarm connection. Connection to fire alarm control panel or monitoring panel shall be accomplished by a Fire Alarms Technician with a current NICET Level II Fire Alarm Systems Certification who is employed by a fire protection company holding a current City of Surprise Business License. A separate *Tenant Improvement (TI)* permit obtained by an approved fire alarm contractor is required.

5307.2.7 Notification. Evacuation notification devices with audible and visual notification shall be provided:

1. Near every point-of-use.
2. In the area or room where the asphyxiant gas cylinders are located.
3. In the common area where public gathers.
4. At the entrance to the room with required detection.
5. It shall be clear to responders upon approach to the hazard that asphyxiant gas is present.
6. As required by the fire code official.

5307.2.7.1 Notification devices. Notification devices shall comply with the following:

1. The notification device shall be rated a minimum of 100 candela rating for a visual effect and 75 decibels for an audible effect.
2. The notification devices shall be identified and labeled for the gas being detected. Use of the building fire alarm notification devices for evacuation is acceptable, providing the asphyxiant gas detection has visible and audible clear indicators in the hazard area upon both the warning level and alarm level of the gas.

5307.3 Insulated liquid carbon dioxide systems used in beverage dispensing applications.

~~Insulated liquid carbon dioxide systems with more than 100 pounds (45.4 kg) of carbon dioxide used in beverage dispensing applications shall comply with Section 5307.3.1.~~

5307.3 Tank and piping requirements. Piping systems shall be designed and constructed and tested in accordance with ASME/ANSI B31.3 Process Piping Code.

~~**5307.3.1 Ventilation.** Where insulated liquid carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, rooms or areas containing storage tanks, cylinders, piping and equipment, and other areas where a leak of carbon dioxide is expected to accumulate, shall be provided with mechanical ventilation in accordance with Section 5004.3 and designed to maintain the room containing carbon dioxide at a negative pressure in relation to the surrounding area.~~

~~**Exception:** A gas detection system complying with Section 5307.3.2 shall be permitted in lieu of mechanical ventilation.~~

5307.3.1 Piping and marking. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed. Markings shall be provided at each valve, at wall, floor or ceiling penetrations, at each change of

direction, and repeated at not less than every 20 feet (6096 mm) or fraction thereof throughout the piping run.

~~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).~~
- ~~2. Activates an audible and visible alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m).~~

5307.3.2 Piping design. Gas piping systems shall be designed as follows:

1. Piping systems shall be designed to a bursting pressure of at least four times the system design pressure.
2. All fittings used in the piping system shall be designed for a working pressure not to exceed 125 percent of designed pressure of the hose.

5307.3.3 Piping materials. Carbon dioxide gas piping systems shall be of listed and approved materials for each specific gas in use. Rigid plastic piping shall not be use or allowed.

Exception: Non-listed materials require a special report by an Arizona registered engineer specifically dealing with the suggested piping material and shall be submitted to the *fire code official* for approval. A special report on the piping material shall not be required if the piping material has been listed by a third-party testing group such as UL or FM for the intended use.

5307.3.4 Leak tests. All piping systems shall be leak tested in accordance with the following:

1. Piping systems shall be tested by a pneumatic pattern at a pressure equal to the working pressure for a minimum of 15 minutes or as long as it takes to check each joint; the test medium shall be carbon dioxide, and soap testing of all fittings shall be witnessed at time of inspection by the *fire code official*.

APPENDIX B FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum *fire-flow* and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and *townhouses* shall be as specified in Tables B105.2 and B105.1(2).

TABLE B105.2

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

TABLE NOT COPIED

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

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

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

APPENDIX C FIRE HYDRANT LOCATIONS AND DISTRIBUTION

C102.1 Minimum number of fire hydrants for a building. The number of fire hydrants available to a building shall be not less than the minimum specified in Table C102.1.

**TABLE C102.1
REQUIRED NUMBER AND SPACING OF FIRE HYDRANTS**

TABLE NOT COPIED

For SI: 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

- a. Reduce by 100 feet for dead-end streets or roads.
- b. Where streets are provided with median dividers that cannot be crossed by fire fighters pulling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis.
- c. 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 for transportation hazards.
- d. Reduce by 50 feet for dead-end streets or roads.
- e. One hydrant for each 1,000 gallons per minute or fraction thereof.
- ~~f. A 50-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Fire Code*.~~
- ~~g. A 25-percent spacing increase shall be permitted where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*.~~
- h.f. The fire code official is authorized to modify the location, number and distribution of fire hydrants based on site-specific constraints and hazards.

APPENDIX D FIRE APPARATUS ACCESS ROADS

D102.1.1 Temporary fire apparatus access. Temporary fire apparatus access road shall be provided prior to delivery of combustible material and/or vertical construction of buildings.

D103.1.1 Temporary access road specifications. Temporary fire department apparatus access road shall be a temporary all weather surface (TAWS) and comply with all of the following criteria:

1. Have an unobstructed width of not less than 26 feet (7925 mm) with a vertical clearance of not less than 15 feet (4572 mm).
2. This access surface shall be ABC compacted to 90% and capable of supporting fire apparatus in excess of 75,000 pounds (34 050 kg) gross vehicle weight (GVW) under any weather condition.
3. The temporary all weather surface (TAWS) shall be continuously maintained by the builder during the construction process.
4. The minimum turning radius shall meet AASHTO SU-40 standard.
5. Temporary dead-end fire apparatus access roads in excess of 100 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

D103.6.3.1 Sign specifications. The temporary fire access sign shall comply with the following criteria:

1. The sign shall read FIRE DEPARTMENT ACCESS and shall include site address or range of addresses for all commercial construction sites and residential model homes site.
2. The sign shall be two sided 4 feet X 4 feet (1219 mm X 1219 mm) using $\frac{3}{4}$ inch (1.9 cm) graded plywood.
3. The sign shall have a red background with white FIRE DEPARTMENT ACCESS in 4 inch (10 cm) lettering.
4. The ADDRESS shall be white 2 $\frac{1}{2}$ inches (6.3 cm) lettering.
5. A sign shall be installed at each point of entry.
6. The sign shall be 6 feet (1828 mm) above grade on posts set at a minimum of 2 feet (609 mm) below grade.

D106.1 Projects having more than 100 dwelling units. Multiple-family residential projects having more than 100 *dwelling units* shall be equipped throughout with three separate and *approved* fire apparatus access roads in accordance with Section 503.1.2.2.1.

Exception: Projects having up to 200 ~~dwelling units~~ shall have not fewer than one ~~approved fire apparatus access road~~ where all buildings, including nonresidential occupancies, are equipped throughout with ~~approved automatic sprinkler systems~~ installed in accordance with Section 903.3.1.1 or 903.3.1.2.

D106.3 Remoteness. ~~Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.~~

The geographic separation of the three fire apparatus access roads shall be based on:

1. The two unrestricted fire apparatus access roads shall be placed a distance apart equal to but not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.
2. The third restricted apparatus access road shall be located based on fire code official approval.

ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES

ICC/ANSI 117.1-2009

Local Amendments

SECTION 502 Parking Spaces

502.7 Identification. Where accessible parking spaces are required to be identified by signs, the signs shall include the International Symbol of Accessibility complying with Section 703.6.3.1 or the Accessibility Icon complying with Section 703.6.3.2. Signs identifying van parking spaces shall contain the designation "van accessible." Such signs shall be 60 inches (1525 mm) minimum above the floor of the parking space, measured to the bottom of the sign.

SECTION 703 Signs

703.6.3 Symbols.

703.6.3.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.6.3.1.

703.6.3.2 Accessibility Icon. The Accessibility Icon shall comply with Figure 703.6.3.2.



FIG. 703.6.3.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY



FIG. 703.6.3.2 ACCESSIBILITY ICON

2018 International Plumbing Code

Local Amendments

Including appendices B, C and E

SECTION 109 MEANS OF APPEAL

[A] 109.1 Application for appeal. General. Appeals shall be in accordance with the Surprise Municipal Code. ~~A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply; or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

[A] 109.1.1 Limitation of authority. ~~The board of appeals shall not have authority relative to interpretation of the administration of this code nor shall such board be empowered to waive requirements of this code.~~

[A] 109.2 Membership of board. ~~The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for 5 years; one for 4 years; one for 3 years; one for 2 years; and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed.~~

[A] 109.2.1 Qualifications. ~~The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:~~

- ~~1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~2. Registered design professional with structural engineering or architectural experience.~~
- ~~3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~4. Registered design professional with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~5. Registered design professional with fire protection engineering experience; or a fire protection contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~

~~[A] 109.2.2 Alternate members.~~ The chief appointing authority shall appoint two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member.

~~Alternate members shall possess the qualifications required for board membership and shall be appointed for 5 years, or until a successor has been appointed.~~

~~[A] 109.2.3 Chairman.~~ The board shall annually select one of its members to serve as chairman.

~~[A] 109.2.4 Disqualification of member.~~ A member shall not hear an appeal in which that member has a personal, professional or financial interest.

~~[A] 109.2.5 Secretary.~~ The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

~~[A] 109.2.6 Compensation of members.~~ Compensation of members shall be determined by law.

~~[A] 109.3 Notice of meeting.~~ The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

~~[A] 109.4 Open hearing.~~ Hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

~~[A] 109.4.1 Procedure.~~ The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

~~[A] 109.5 Postponed hearing.~~ When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

~~[A] 109.6 Board decision.~~ The board shall modify or reverse the decision of the code official by a concurring vote of three members.

~~[A] 109.6.1 Resolution.~~ The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

~~[A] 109.6.2 Administration.~~ The code official shall take immediate action in accordance with the decision of the board.

~~[A] 109.7 Court review.~~ Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

202 GENERAL DEFINITIONS

GREASE INTERCEPTOR

Gravity. Plumbing appurtenances of not less than 500 gallons (1893 L) capacity that are installed in the sanitary drainage system to intercept free-floating fats, oils and grease from waste water discharge. Separation is accomplished by gravity during a retention time of not less than 30 minutes approved by the Authority Having Jurisdiction.

GREASE REMOVAL DEVICE, AUTOMATIC (GRD). A plumbing appurtenance that is installed in the sanitary drainage system to intercept free-floating fats, oils and grease from waste water discharge. Such a device operates on a time-or event-controlled basis and has the ability to remove free-floating fats, oils and grease automatically without intervention from the use, except for maintenance. These devices must be able to perform as a gravity interceptor if mechanical or electrical power is lost, and provide continuous separation.

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of ~~15~~ 50 or fewer.

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. ~~In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.~~ In other occupancies, where drinking fountains are required, bottle water dispensers or water coolers shall be permitted to be substituted.

1003.2 Approval. The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions and the requirements of ~~this section based on the anticipated conditions of use~~ the Authority Having Jurisdiction. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

1106.1 General. The size of the vertical conductors and leaders, building storm drains, building storm sewers, and any horizontal branches of such drains or sewers shall be based on ~~the 100-year hourly rainfall rate indicated in Figure 1106.1 or on other rainfall rates determined from approved local weather data.~~ an hourly rainfall rate of three (3) inches per hour.

2018 International Mechanical Code

Local Amendments

SECTION 109 MEANS OF APPEAL

[A] 109.1 Application for appeal. General. ~~Appeals shall be in accordance with the Surprise Municipal Code. A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply; or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

[A] 109.1.1 Limitation of authority. ~~The board of appeals shall not have authority relative to interpretation of the administration of this code nor shall such board be empowered to waive requirements of this code.~~

[A] 109.2 Membership of board. ~~The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for 5 years; one for 4 years; one for 3 years; one for 2 years; and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed.~~

[A] 109.2.1 Qualifications. ~~The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:~~

- ~~1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~2. Registered design professional with structural engineering or architectural experience.~~
- ~~3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~4. Registered design professional with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~5. Registered design professional with fire protection engineering experience; or a fire protection contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~

~~[A] 109.2.2 Alternate members.~~ The chief appointing authority shall appoint two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member.

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~~[A] 109.4.1 Procedure.~~ The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

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~~[A] 109.6 Board decision.~~ The board shall modify or reverse the decision of the code official by a concurring vote of three members.

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~~[A] 109.7 Court review.~~ Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. Nonmetallic piping shall not be installed in exposed locations. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

[B] 309.1 Space-heating systems. Heating and Cooling systems. Habitable spaces ~~Interior spaces~~ intended for human occupancy shall be provided with active or passive space-heating and space-cooling systems capable of maintaining a minimum indoor temperatures between 70 of 68°F (20°C) and 90°F (32°C) at a point 3 feet (914 mm) above the floor on the design heating day. The installation of portable space heaters or coolers shall not be used to achieve compliance with this section.

403.3.1.5 Balancing. The *ventilation air* distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced Sections 403.3 and 403.4. by an *approved* method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by A final report shall be provided to the engineer of record and the mechanical inspector.

Exception: Residential occupancies shall be exempt from this provision.

407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170.

407.1.1 Mechanical systems designed and installed in accordance with IMC 407.1 and ASHRAE 170-2017 shall be verified by a qualified third party Special Inspector. The Special Inspector/testing agency shall be an independent third party individual or firm and shall not be the installing contractor. A report shall be generated by the third party individual or firm showing compliance. Special inspections shall be as specified in Chapter 17 of the International Building Code as amended.

408 MARIJUANA RELATED OCCUPANCIES

408.1 General. Any building used to cultivate, produce, infuse or dispense marijuana shall be designed such that there shall be no emission of dust, fumes, vapors, or odors into the environment from the premise. A ventilation system shall be designed to prevent the distribution of odors to other occupied parts of the building or adjacent properties. Design of the odor control system shall be based on accepted engineering practices. All

equipment and filter media shall be listed and labeled for the application. Exhaust systems used in odor control systems shall meet the requirements of Section 501.

408.1.1 Exhaust outlets. The termination point for exhaust outlets shall be in accordance with Section 501.3. Exhaust from cultivation and production facilities shall be in accordance with Section 501.3.1(2) and for dispensaries in accordance with Section 501.3.1(3).

502.14 Motor vehicle operation. In areas where motor vehicles operate, mechanical ventilation shall be provided in accordance with Section 403. Additionally, areas in which stationary motor vehicles are operated shall be provided with a *source capture system* that connects directly to the motor vehicle exhaust systems. Makeup air for the required exhaust systems in areas where motor vehicles operate shall be provided through permanent unobstructed openings to the outdoors, such as louvers and grills. Mechanical equipment and louvers used for makeup air purposes shall be electrically interlocked with the exhaust system.

Exceptions:

1. This section shall not apply where the motor vehicles being operated or repaired are electrically powered.
2. This section shall not apply to one- and two-family dwellings.
3. This section shall not apply to motor vehicle service areas where engines are operated inside the building only for the duration necessary to move the motor vehicles in and out of the building.

928.1 General

Evaporative cooling equipment shall:

1. Be installed in accordance with the manufacturer's instructions.
2. Be installed on level platforms in accordance with Section 304.10. An evaporative cooler supported by the building structure shall be installed on a substantial level base and shall be secured directly or indirectly to the building structure by suitable means to prevent displacement of the cooler. Modifications made to the supporting framework of buildings as a result of the installation shall be made in accordance with the requirements of the International Building Code as amended.
3. Have openings in exterior walls or roofs flashed in accordance with the International Building Code as amended.
4. Be provided with potable water backflow protection in accordance with Section 608 of the International Building Code.
5. Have air intake opening locations in accordance with Section 401.4.
6. A permanent relief opening or other engineered design sufficient to assure positive airflow shall balance intake air.

7. Outside air shall be provided as specified in Section 403.2.
8. Air ducts and dampers, which are a portion of an evaporative cooling system, shall comply with Chapter 6.
9. Overflow drains shall be provided that discharge to an approved disposal location.

SECTION 930 WOODSTOVE/FIREPLACE INSTALLATION

Definitions. For purposes of this section, the following words and terms shall have the meaning ascribed thereto:

Fireplace: A built-in-place masonry hearth and fire chamber or a factory-built appliance, designed to burn solid fuel or to accommodate gas or electric log insert or similar device, and which is intended for occasional recreational or aesthetic use, not for cooking, heating, or industrial processes.

Solid fuel: Includes, but is not limited to, wood, coal, or other non-gaseous or non-liquid fuels, including those fuels defined by the Maricopa County Air Pollution Control Officer as "inappropriate fuel" to burn in residential wood burning devices.

Woodstove: A solid-fuel burning heating appliance including a pellet stove, which is either freestanding or designed to be inserted into a fireplace.

930.2 General. In accordance with Maricopa County regulations, on or after December 31, 1998, no person, firm or corporation shall construct or install a fireplace or a wood stove, and the Building Official shall not approve or issue a permit to construct or install a fireplace or a wood stove, unless the fireplace or wood stove complies with one of the following:

1. A fireplace which has a permanently installed gas or electric log insert;
2. A fireplace, wood stove or other solid fuel burning appliance which has been certified by the United States Environmental Protection Agency as conforming to 40 Code of Federal Regulations part 60, subpart AAA;
3. A fireplace, woodstove or other solid fuel burning appliance that has been tested and listed by a nationally recognized testing agency to meet performance standards equivalent to those adopted by 40 Code of Federal Regulations part 60, subpart AAA;
4. A fireplace, wood stove or other solid fuel burning appliance which has been determined by the Maricopa County Air Pollution Control Officer to meet performance standards equivalent to those adopted by 40 Code of Federal Regulations part 60, subpart AAA, as in effect on July 1, 1990.
5. A fireplace which has a permanently installed wood stove insert which complies with subparagraph 2, 3, or 4 above.

Exceptions: The following installations are not regulated and are not prohibited by this section:

1. Furnaces, boilers, incinerators, kilns, and other similar space heating or industrial process equipment.
2. Cook stoves, barbecue grills, and similar appliances designed primarily for cooking.
3. Fire pits, barbecue grills, and other outdoor fireplaces

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2018 International Fuel Gas Code

Local Amendments

SECTION 109 MEANS OF APPEAL

[A] 109.1 Application for appeal. General. ~~Appeals shall be in accordance with the Surprise Municipal Code. A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply; or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

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- ~~2. Registered design professional with structural engineering or architectural experience.~~
- ~~3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~4. Registered design professional with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~
- ~~5. Registered design professional with fire protection engineering experience; or a fire protection contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~

[A] 109.2.2 Alternate members. ~~The chief appointing authority shall appoint two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member.~~

~~Alternate members shall possess the qualifications required for board membership and shall be appointed for 5 years, or until a successor has been appointed.~~

~~[A] 109.2.3 Chairman.~~ The board shall annually select one of its members to serve as chairman.

~~[A] 109.2.4 Disqualification of member.~~ A member shall not hear an appeal in which that member has a personal, professional or financial interest.

~~[A] 109.2.5 Secretary.~~ The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

~~[A] 109.2.6 Compensation of members.~~ Compensation of members shall be determined by law.

~~[A] 109.3 Notice of meeting.~~ The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

~~[A] 109.4 Open hearing.~~ Hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

~~[A] 109.4.1 Procedure.~~ The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

~~[A] 109.5 Postponed hearing.~~ When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

~~[A] 109.6 Board decision.~~ The board shall modify or reverse the decision of the code official by a concurring vote of three members.

~~[A] 109.6.1 Resolution.~~ The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

~~[A] 109.6.2 Administration.~~ The code official shall take immediate action in accordance with the decision of the board.

~~[A] 109.7 Court review.~~ Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

404.12 Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade, ~~except as provided for in Section 404.12.1 for metal piping and 18 inches (457mm) for plastic piping.~~

~~**404.12.1 Individual outside appliances.** Individual lines to outside lights, grills or other appliances shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is approved and is installed in locations not susceptible to physical damage.~~

2018 International Energy Conservation Code

Local Amendments

SECTION C101 SCOPE AND GENERAL REQUIREMENTS (COMMERCIAL)

C101.2 Scope. This code applies to *commercial buildings* and the building sites and associated systems and equipment. Group R-2 when defined as a *Commercial Building* by section C202, shall have the option of complying under the Residential Provisions of the code, regardless of height. Once defined as such on the submittal documents, all components of the Residential Provisions shall be followed.

C109.1 General. Appeals shall be in accordance with the Surprise Municipal Code. ~~In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The Code Official shall be an ex-officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. 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 Code Official.~~

C109.2 Limitations on authority. ~~An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have not have the authority to waive requirements of this code.~~

C109.3 Qualifications. ~~The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.~~

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of ANSI/ASHRAE/IESNA 90.1.
2. The requirements of Sections C402 through C405 and C408. In addition, commercial buildings shall comply with Section C406 and tenant spaces shall comply with Section C406.1.1.
3. The requirements of Sections C402.5, C403.2, C403.3 through C403.3.2, C403.4 through C403.4.2.3, C403.5.5, C403.7, C403.8.1 through C403.8.4, C403.10.1 through C403.10.3, C403.11, C403.12, C404, C405, and C407 ~~and C408~~. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

4. Compliance with the provisions of Section C408 are optional.

~~C404.9.3 Covers.~~ Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other approved vapor-retardant means.

~~Exception:~~ Where more than 75 percent of the energy for heating, computed over an operating season of not fewer than 3 calendar months, is from site-recovered energy such as from a heat pump or on-site renewable energy system, covers or other vapor-retardant means shall not be required.

~~C405.2.6.2 Decorative lighting shutoff.~~ Building façade and landscape lighting shall automatically shut off from not later than 1 hour after business closing to not earlier than 1 hour before business opening.

~~C405.2.6.3 Lighting setback.~~ Lighting that is not controlled in accordance with Section C405.2.6.2 shall be controlled so that the total wattage of such lighting is automatically reduced by not less than 30 percent by selectively switching off or dimming luminaires at one of the following times:

1. ~~From not later than midnight to not earlier than 6 a.m.~~
2. ~~From not later than one hour after business closing to not earlier than one hour before business opening.~~
3. ~~During any time where activity has not been detected for 15 minutes or more.~~

R101.2 Scope. This code applies to *residential buildings* and the building sites and associated systems and equipment. Group R-2 when defined as a *Residential Building* by section R202, shall have the option of complying under the Commercial Provisions of the code, regardless of height. Once defined as such on the submittal documents, all components of the Commercial Provisions shall be followed.

R102.1.2 RESNET testing & inspection protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System, Standards Protocol for third party testing and inspections, shall be deemed to meet the requirements of sections R402.4.1.1, R402.4.1.2 and R403.2.2. and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.

3. Third Party Testing is required for the following items:
 - a. R402.4.1.1 – Building Envelope – Thermal and Air Barrier Checklist
 - b. R402.4.1.2 – Testing – Air Leakage Rate
 - c. R403.2.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 4 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

~~R109.1 General.~~ ~~Appeals shall be in accordance with the Surprise Municipal Code. In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The Code Official shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. 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 Code Official.~~

~~R109.2 Limitations on authority.~~ ~~An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have the authority to waive requirements of this code.~~

~~R109.3 Qualifications.~~ ~~The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.~~

R403.3 Ducts. Ducts and air handlers shall be in accordance with Sections R403.3.1 through R403.3.7.

R403.3.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

Exceptions: Ducts or portions thereof located completely inside the building thermal envelope.

1. Ducts or portions thereof located completely inside the building thermal envelope.
2. Supply ducts may be insulated to a minimum of R-6 when one

or more of the following conditions are met;

- 2.1 Minimum SEER rating of space heating/cooling system is increased to 15.
- 2.2 Maximum U-factor is decreased to 0.35 and maximum SHGC is decreased to 0.22 for all fenestration products.
- 2.3 Wall cavity insulation minimum R-value is increased to R-19.
- 2.4 Residential buildings that meet the requirements of sections R102.1.1 or R405.

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding five air changes per hour in *Climate Zones* 1 and 2, and three air changes per hour in Zones 3 through 8. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported as a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *building official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *building official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

EXCEPTIONS:

1. Additions, alterations, renovations or repairs to existing structures.
2. Conditioned garages.

Section R403.10.3 ~~Covers~~ Variable Speed Pool Pumps

R403.10.3 ~~Heated pools and in-ground permanently installed spas shall be provided with a vapor-resistant cover.~~

Exception: ~~Pools deriving over 70% of the energy for heating from site-recovered energy, such as a heat pump or solar energy source computed over an operating season.~~

Motors with a total horsepower of one or more for pools and in-ground permanently installed spas shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate and shall be operated with a pump control with the capability of operating the pump at two or more speeds. Residential pool pump motor controls that are sold for use with a two or more speed motor shall have a default circulation speed setting no more than one-half of the motor's maximum rotation rate. Any high speed override capability shall be for a temporary period not to exceed one twenty-four hour cycle without resetting to the default setting.

R406.4 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value indicated in Table N1106.4 when compared to the ERI *reference design*.

TABLE R406.4

MAXIMUM ENERGY RATING INDEX	
CLIMATE ZONE	ENERGY RATING INDEX
1	57
2	57 64
3	57
4	62
5	61
6	61
7	58
8	58

2017 National Electrical Code

Local Amendments

Article 250 – Grounding and Bonding

250.118 Types of Equipment Grounding Conductors.

The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

- (1) A copper, aluminum, or copper-clad aluminum conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape.
- (2) Rigid metal conduit.
- (3) Intermediate metal conduit.
- (4) Electrical metallic tubing with an additional equipment grounding conductor.
- (5) Listed flexible metal conduit meeting all the following conditions:
 - a. The conduit is terminated in listed fittings.
 - b. The circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
 - c. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground-fault current path does not exceed 1.8 m (6 ft).
 - d. If used to connect equipment where flexibility is necessary to minimize the transmission of vibration from equipment or to provide flexibility for equipment that requires movement after installation, an equipment grounding conductor shall be installed.
- (6) Listed liquid-tight flexible metal conduit meeting all the following conditions:
 - a. The conduit is terminated in listed fittings.
 - b. For metric designators 12 through 16 (trade sizes 3/8 through 1/2), the circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
 - c. For metric designators 21 through 35 (trade sizes 3/4 through 1-1/4), the circuit conductors contained in the conduit are protected by overcurrent devices rated not more than 60 amperes and there is no flexible metal conduit, flexible metallic tubing, or liquid-tight flexible metal conduit in trade sizes metric designators 12 through 16 (trade sizes 3/8 through 1/2) in the ground-fault current path.
 - d. The combined length of flexible metal conduit and flexible metallic tubing and liquid-tight flexible metal conduit in the same ground-fault current path does

not exceed 1.8 m (6 ft).

- e. If used to connect equipment where flexibility is necessary to minimize the transmission of vibration from equipment or to provide flexibility for equipment that requires movement after installation, an equipment grounding conductor shall be installed.

(7) Flexible metallic tubing where the tubing is terminated in listed fittings and meeting the following conditions:

- a. The circuit conductors contained in the tubing are protected by overcurrent devices rated at 20 amperes or less.
- b. The combined length of flexible metal conduit and flexible metallic tubing and liquid-tight flexible metal conduit in the same ground-fault current path does not exceed 1.8 m (6 ft).

(8) Armor of Type AC cable as provided in 320.108.

(9) The copper sheath of mineral-insulated, metal-sheathed cable.

(10) Type MC cable that provides an effective ground-fault current path in accordance with one or more of the following:

- a. It contains an insulated or uninsulated equipment grounding conductor in compliance with 250.118(1)
- b. The combined metallic sheath and uninsulated equipment grounding/bonding conductor of interlocked metal tape-type MC cable that is listed and identified as an equipment grounding conductor
- c. The metallic sheath or the combined metallic sheath and equipment grounding conductors of the smooth or corrugated tube-type MC cable that is listed and identified as an equipment grounding conductor

(11) Cable trays as permitted in 392.10 and 392.60.

(12) Cable bus framework as permitted in 370.3.

(13) Other listed electrically continuous metal raceways and listed auxiliary gutters.

(14) Surface metal raceways listed for grounding.

2018 International Existing Building Code

Local Amendments

SECTION 112 BOARD OF APPEALS

[A] 112.1 General. ~~Appeals shall be in accordance with the Surprise Municipal Code. In order to hear and decide appeals of orders, decisions, or determinations made by the Code Official relative to the application and interpretation of this Code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.~~

[A] 112.2 Limitations on authority. ~~An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

[A] 112.3 Qualifications. ~~The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.~~

2018 International Green Construction Code

Local Amendments

SECTION 101 GENERAL

101.2 General. The use of this code is optional, unless specifically required through ordinance by the City of Surprise. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Board of Construction Review

2018 I-Code Adoption and Local Amendment Overview

October 3, 2019

2018 I-Code Adoption Overview

International Code Council – Building Codes

- **Based in Washington D.C.**
- **16 Years as Consolidated Organization**
- **100+ Years of Building Code Development**
- **Develops Codes and Standards**
- **All Regions and Geographies**
- **Most Widely Used Building Code in United States**
- **New Materials, Methods and Technologies**
- **Safe and Resilient Structures**

Public Comment Period

- **60 Days on Website**
- **Press Release**
- **1 Public Comment**
- **3 Stakeholder Comments**

Stakeholder Comments

- **Homebuilders Association of Central Arizona**
 - **Residential Energy Sampling**
 - **Measuring Fire Separation Distance**
 - **400 CFM Kitchen Hoods**
- **All Implemented**

2018 I-Code Adoption Overview

Public Comment

- **Require Hot Water Recirculation Pumps For All Residential Homes**
 - **Homebuilders Offer as Option**
 - **Tankless Water Heater Option**
 - **Not Implemented**

Types of Amendments

- **Regional Best Practices**
- **Developed for Compliance**
 - **Federal Law**
 - **Arizona Revised Statutes**
 - **County Requirements**

2018 I-Code Adoption Overview

2018 International Building Code

- **Exemptions and Definitions**
- **Assisted Living Homes**
- **Temperature Control**
- **Masonry Reinforcement**



2018 I-Code Adoption Overview

2018 International Residential Code

- **Exemptions**
- **Design Criteria**
- **Garage Protection**



2018 I-Code Adoption Overview

2018 International Fire Code

- **CO2 Bulk Systems**
- **Emergency Responder Radio Systems**
- **Public Access Defibrillators**
- **High Piled Storage**
- **Annual Inspections for Assisted Living Homes**



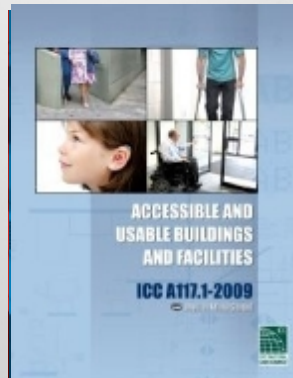
2018 International Residential Code

- **Appendices**
 - **Manufactured Housing**
 - **Floodplain Administration**
 - **Sound Attenuation**
 - **Pool Barriers**

2018 I-Code Adoption Overview

Accessible and Usable Buildings and Facilities ICC A 117.1-2009

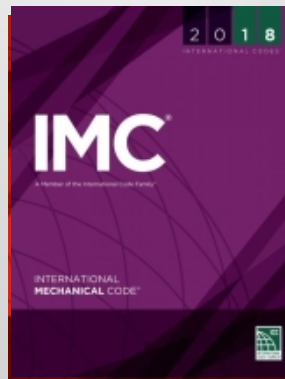
- **Accessibility Icon**



2018 I-Code Adoption Overview

2018 International Mechanical Code

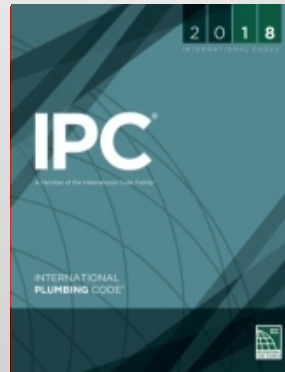
- **Prohibits Plastic Piping in Exposed Locations**
 - **HVAC Condensation Lines**
- **Temperature Control – Cooling**
- **Marijuana Occupancies**
- **Wood Stoves and Fireplaces**



2018 I-Code Adoption Overview

2018 International Plumbing Code

- **Definitions – Grease Interceptors**
 - **Align with Water Resource Management**
- **Water Dispenser for Drinking Fountain**
- **Rainfall Design Criteria for Roof Drainage**



2018 I-Code Adoption Overview

2018 International Energy Conservation Code

- **Multi-Family Options**
- **Efficiency Tradeoffs**
 - **High Efficiency Equipment**
 - **Prescriptive Requirements**
- **Variable Speed Pool Pumps - ARS**



2018 I-Code Adoption Overview

2018 International Fuel Gas Code

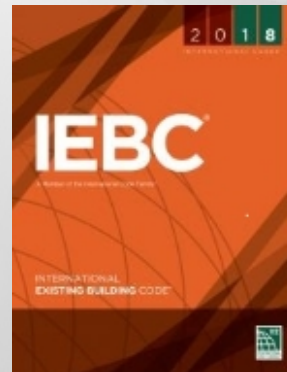
- Burial Depth



2018 I-Code Adoption Overview

2018 International Existing Building Code 2018 International Green Construction Code

- Voluntary Compliance
- Optional Compliance Paths
- LEED Performance Buildings



2018 I-Code Adoption Overview

Implementation

- **October 15 – City Council Meeting -**
 - **Request for Adoption**
 - **November 14 – Effective Date**

2018 I-Code Adoption Overview

Questions and Comments