

ORDINANCE # 2020-23

AN ORDINANCE OF THE MAYOR AND COUNCIL OF THE CITY OF SURPRISE, ARIZONA, AMENDING SURPRISE MUNICIPAL CODE CHAPTER 105, ARTICLE II, DIVISION 1, SECTION 105-19, THE 2018 INTERNATIONAL FIRE CODE, AS PREVIOUSLY AMENDED, BY FURTHER AMENDING CHAPTERS 5, 9 AND 12 ; INCLUDING SEVERABILITY; REPEALING CONFLICTING ORDINANCES AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, the City adopted an amended version of Chapter 12 of the 2018 International Fire Code (2018 IFC) on August 6, 2019 and an amended version of the rest of the 2018 IFC on October 15, 2019;

WHEREAS, the Staff of the Fire-Medical Department have now had an opportunity to evaluate and apply the provisions of the 2018 IFC here in the City of Surprise; and

WHEREAS, the Staff of the Fire-Medical Department now desire to amend the adopted 2018 IFC with certain amendments based upon that experience, evaluation and application.

NOW, THEREFORE, BE IT ORDAINED by the Mayor and Council of the City of Surprise, Arizona, as follows:

Section 1. The 2018 International Fire Code, as adopted and amended by City of Surprise Ordinance 2019-21 (and as set forth in a certain public record entitled “2019 Amendments to the 2018 International Fire Code, Chapter 12 Energy Systems” dated August 6, 2019) is hereby further amended to the extent set forth in Exhibit A attached hereto and incorporated by this reference. All other provisions of Chapter 12 as previously adopted and amended by Ordinance 2019-21 shall remain unchanged and in effect.

Section 2. The 2018 International Fire Code, Chapters 5 and 9, as adopted and amended by City of Surprise Ordinance 2019-25 (as set forth in a certain public record adopted by Resolution 2019-108, and entitled, “Local Amendments to the 2018 International Codes and the 2017 National Electrical Code” dated November 14, 2019) is hereby further amended to the extent set forth in Exhibit B attached hereto and incorporated by this reference. All other provisions of Chapters 5 and 9, as previously adopted and amended by Ordinance 2019-25 shall remain unchanged and in effect.

Section 3. Surprise Municipal Code, Chapter 105, Article II, Division 1, Section 105-19 is amended to read as follows

Sec. 105-19. - Construction codes.

- (a) 2018 International Building Code.
- (b) 2018 International Residential Code.
- (c) 2017 National Electrical Code.
- (d) 2018 International Mechanical Code.
- (e) 2018 International Plumbing Code.
- (f) 2018 International Fuel Gas Code.
- (g) 2018 International Energy Conservation Code.
- (h) 2006 International Property Maintenance Code.
- (i) 2018 International Existing Building Code.
- (j) 2018 International Fire Code.
- (k) 2018 International Green Construction Code.

A certain public record entitled Local Amendments to the 2018 International Codes and the 2017 National Electrical Code dated November 14, 2019, specifically amends the 2018 building code, residential code, electrical code, mechanical code, plumbing code, fuel gas code, energy conservation code, Green Construction Code, existing building code and fire code. The 2018 International Fire Code is further amended by that certain public record entitled 2019 Amendments to the 2018 International Fire Code, Chapter 12 Energy Systems dated August 6, 2019. LASTLY, THE 2018 INTERNATIONAL FIRE CODE, AS AMENDED ABOVE, IS FURTHER AMENDED BY ORDINANCE 2020-23.

Section 4. All ordinances, resolutions or codes in conflict with the provisions of this Ordinance or Code adopted by this Ordinance are repealed.

Section 5. If any section, subsection, sentence, clause, phrase or portion of this Ordinance or any part of these amendments to the municipal code adopted herein is for any reason held to be invalid or unconstitutional by decision of any court of competent jurisdiction, such decision will not be read to affect the validity of the remaining portions thereof.

Section 6. This ordinance will become effective at the time and manner prescribed by law.

SIGNATURES TO FOLLOW ON NEXT PAGE

PASSED AND ADOPTED this ____ day of _____, 2020.

Skip Hall, Mayor

Attest:

Approved as to form:

Sherry Aguilar, City Clerk

Robert Wingo, City Attorney

ORDINANCE 2020-23
EXHIBIT A

CHAPTER 12 ENERGY SYSTEMS

SECTION 1201 GENERAL

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation and maintenance of energy systems used for generating or storing energy UTILIZING BATTERIES OF ANY TYPE, CAPACITORS, MAGNETIC OR ANY OTHER EMERGING TECHNOLOGY, REGARDLESS OF OWNERSHIP OR CONTROL OF THE SYSTEMS. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

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1203.1.1 Stationary generators. Stationary emergency and standby power generators required by this code shall be listed in accordance with UL 2200. ASSOCIATED FLAMMABLE OR COMBUSTIBLE LIQUID TANKS SHALL ALSO COMPLY WITH CHAPTERS 50 AND 57.

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1204.1.1 PERMITS. PERMITS SHALL BE OBTAINED FOR SOLAR VOLTAIC SYSTEMS IN ACCORDANCE WITH SECTION 105.7.21

EXCEPTION: SOLAR PHOTOVOLTAIC SYSTEMS WITH LESS THAN 3 KW ALTERNATING CURRENT NAMEPLATE RATING.

1204.1.2 MARKING. MARKING IS REQUIRED ON INTERIOR AND EXTERIOR DIRECT-CURRENT (DC) CONDUIT, ENCLOSURES, RACE- WAYS, CABLE ASSEMBLIES, JUNCTION BOXES, COMBINER BOXES AND DISCONNECTS.

1204.1.2.1 MATERIALS. THE MATERIALS USED FOR MARKING SHALL BE REFLECTIVE, WEATHER RESISTANT AND SUITABLE FOR THE ENVIRONMENT. MARKING AS REQUIRED IN SECTIONS 1204.1.2 THROUGH 1204.1.6 SHALL HAVE ALL LETTERS CAPITALIZED WITH A MINIMUM HEIGHT OF 3/8 INCH (9.5 MM) WHITE ON RED BACKGROUND.

1204.1.2.2 MARKING CONTENT. THE MARKING SHALL CONTAIN THE WORDS "WARNING: PHOTOVOLTAIC POWER SOURCE."

1204.1.2.3 MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECT IN A LOCATION CLEARLY VISIBLE FROM THE LOCATION WHERE THE DISCONNECT IS OPERATED.

1204.1.3 LOCATION OF MARKING. MARKING SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES EVERY 10 FEET (3048 MM), WITHIN 1 FOOT (305 MM) OF TURNS OR BENDS AND WITHIN 1 FOOT (305 MM) ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS.

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1204.2 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 1204.2.1 through 1204.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment.

RESIDENTIAL STRUCTURES SHALL BE DESIGNED SO THAT EACH PHOTOVOLTAIC ARRAY IS NOT GREATER THAN 150 FEET (45 720 MM) BY 150 FEET (45 720 MM) IN EITHER AXIS.

1204.2.1 Solar photovoltaic systems for Group R-3 buildings. Solar photovoltaic systems for Group R-3 buildings shall comply with Sections 1204.2.1.1 through ~~1204.2.1.3~~ 1204.2.1.5.

EXCEPTIONS:

1. ~~These requirements shall not apply to structures designed and constructed in accordance with the *International Residential Code*.~~
2. ~~These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal or less.~~

1204.2.1.1 ROOF ACCESS POINTS. ROOF ACCESS POINTS SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES, OR SIGNS.

1204.2.1.2 RESIDENTIAL BUILDINGS WITH HIP ROOF LAYOUTS. PANELS OR MODULES INSTALLED ON RESIDENTIAL BUILDINGS WITH HIP ROOF LAYOUTS SHALL BE LOCATED IN A MANNER THAT PROVIDES TWO 3-FOOT-WIDE (914 MM) CLEAR ACCESS PATHWAY FROM THE EAVE TO THE RIDGE ON EACH ROOF SLOPE WHERE PANELS OR MODULES ARE LOCATED.

1204.2.1.3 RESIDENTIAL BUILDINGS WITH A SINGLE RIDGE.

PANELS/MODULES INSTALLED ON RESIDENTIAL BUILDINGS WITH A SINGLE RIDGE SHALL BE LOCATED IN A MANNER THAT PROVIDES TWO 3-FOOT-WIDE (914 MM) ACCESS PATHWAYS FROM THE EAVE TO THE RIDGE ON EACH ROOF SLOPE WHERE PANELS/MODULES ARE LOCATED.

1204.2.1.4 RESIDENTIAL BUILDINGS WITH ROOF HIPPS AND VALLEYS.

PANELS OR MODULES INSTALLED ON RESIDENTIAL BUILDINGS WITH ROOF HIPPS AND VALLEYS SHALL BE LOCATED NOT CLOSER THAN 18 INCHES (457 MM) TO A HIP OR A VALLEY WHERE PANELS OR MODULES ARE TO BE PLACED ON BOTH SIDES OF A HIP OR VALLEY. WHERE PANELS ARE TO BE LOCATED ON ONLY ONE SIDE OF A HIP OR VALLEY THAT IS OF EQUAL LENGTH, THE PANELS SHALL BE PERMITTED TO BE PLACED DIRECTLY ADJACENT TO THE HIP OR VALLEY.

1204.2.1.5 RESIDENTIAL BUILDING SMOKE VENTILATION. PANELS/MODULES INSTALLED ON RESIDENTIAL BUILDINGS SHALL BE LOCATED NO HIGHER THAN 3 FEET (914 MM) BELOW THE RIDGE IN ORDER TO ALLOW FOR FIRE DEPARTMENT SMOKE VENTILATION OPERATIONS.

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1204.3 Other than Group R-3 buildings. Access to systems for buildings, other than those containing Group R-3 occupancies, shall be provided in accordance with Sections 1204.3.1 through 1204.3.3.

Exception: Where it is determined by the *fire code official* that the roof configuration is similar to that of a Group R-3 occupancy, the residential access and ventilation requirements in Sections 1204.2.1.1 through ~~1204.2.1.3~~ 1204.2.1.5 are a suitable alternative.

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1204.3.2 Interior pathways. Interior pathways shall be provided between array sections to meet the following requirements:

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4. THE PATHWAY SHALL BE OVER AREAS CAPABLE OF SUPPORTING THE LIVE LOAD OF FIREFIGHTERS ACCESSING THE ROOF.
 5. THE CENTERLINE AXIS PATHWAYS SHALL BE PROVIDED IN BOTH AXES OF THE ROOF. CENTERLINE AXIS PATHWAYS SHALL RUN WHERE THE ROOF STRUCTURE IS CAPABLE OF SUPPORTING THE LIVE LOAD OF FIRE FIGHTERS ACCESSING THE ROOF.

1204.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

- . . .
3. ~~A pathway not less than 4 feet (1219 mm) wide bordering 4 foot by 8 foot (1219 mm by 2438 mm) venting cutouts every 20 feet (6096 mm) on alternating sides of the pathway.~~ ARRAYS SHALL BE NOT GREATER THAN 150 FEET (45 720 MM) BY 150 FEET (45 720 MM) IN DISTANCE IN EITHER AXIS IN ORDER TO CREATE OPPORTUNITIES FOR FIRE DEPARTMENT SMOKE VENTILATION OPERATIONS.

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1206.2 Stationary storage battery systems. Stationary storage battery systems having capacities exceeding the values shown in Table 1206.2 shall comply with Section 1206.2.1 through 1206.2.12.6, as applicable. *APPROVED SIGNAGE IS REQUIRED FOR ALL INSTALLATIONS.

1206.2.1 Permits. Permits shall be obtained for the construction of stationary storage battery systems WITH A CAPACITY OF 3 KWH OR MORE, in accordance with Section 105.7.2.

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1206.2.3 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Battery technologies not specifically identified in Table 1206.2 are provided.
2. More than one stationary storage battery technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities in accordance with Section 1206.2.9.

4. WHERE REQUIRED BY THE *FIRE CODE OFFICIAL*.

1206.2.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the *fire code official*. Only single-failure modes shall be considered.

1. Thermal runaway condition in a single-battery storage rack, module or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the stationary battery storage system.
6. Failure of the smoke detection, fire-extinguishing or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.
8. FAILURE OF TEMPERATURE CONTROL.

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1206.2.3.6 FORENSIC ANALYSIS. THE *FIRE CODE OFFICIAL* MAY ALSO REQUIRE A FORENSIC ANALYSIS OF THE CAUSE OF FAILURE BY AN INDEPENDENT LABORATORY APPROVED BY THE *FIRE CODE OFFICIAL* IN ACCORDANCE WITH SECTION 104.10.2.

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1206.2.8.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 kWh (180 megajoules) each. Each stationary battery array shall be spaced not less than 3 feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium storage battery arrays.
2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 250 kWh (900 megajoules) each, WHERE *APPROVED BY THE FIRE CODE OFFICIAL*.

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1206.2.8.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a ~~minimum 5 feet (1524 mm)~~ NOT LESS THAN 10 FEET (3048 mm) from the following:

1. Lot lines.
2. Public ways.
3. Buildings.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

Exception: The *fire code official* is authorized to approve smaller separation distances if largescale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not

adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.2.11.3 EXHAUST Ventilation. Where required by ~~Section 1206.2.3 or 1206.2.12~~ TABLE 1206.2.10, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the *International Mechanical Code* and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 10 percent of the lower flammability limit, or for hydrogen, 1.0 percent of the total volume of the room.
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min). The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

1206.4 Energy storage system in Group R-3 and R-4 occupancies. Energy storage systems in Group R-3 and R-4 occupancies shall be installed and maintained in accordance with this section. The temporary use of an owner or occupant's electric-powered vehicle as an energy storage system shall be in accordance with 1206.4.

EXCEPTION: ENERGY STORAGE SYSTEMS IN GROUP R-3 AND R-4 OCCUPANCIES WITH A CAPACITY OF 3 KWH OR LESS.

1206.4.3 Location. Energy storage systems shall only be installed in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the dwelling unit living space and sleeping units in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors on exterior walls in accordance with 1206.4.3.1
4. ~~Utility closets and storage or utility spaces within dwelling units and sleeping units~~
OTHER LOCATIONS WITH FIRE MARSHAL APPROVAL.

1206.4.3.1 Exterior wall AND OUTDOOR installations. Energy storage systems shall be permitted to be installed outdoors on exterior walls of buildings OR ON THE GROUND where all of the following conditions are met:

1. The maximum energy capacity of individual energy storage system units shall not exceed 20 kWh.
2. ~~The energy storage system shall comply with applicable requirements in Sections 1206~~
THE INSTALLATION IS IN ACCORDANCE WITH ZONING SETBACK REQUIREMENTS.
3. The energy storage system shall be installed in accordance with the manufacturer's instructions and their listing.
4. Individual energy storage system units shall be separated from each other by not less than 3 feet (914 mm).

5. The energy storage system shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least 5 feet (1524 mm).

Exception: Where approved by the *fire code official*, smaller separation distances in Items 4 and 5 may be permitted based on large scale fire testing

1206.4.4 Energy ratings. Individual energy storage systems units shall have a maximum rating of 20 kwh. The aggregate rating structure shall not exceed:

~~1. 40 KWH within utility closets and storage or utility spaces.~~

1. 2. 80 kWh in attached or detached garages and detached accessory structures.

2. 3. 80 kWh on exterior walls.

3. 4. 80 kWh outdoors on the ground.

ORDINANCE 2020-23
EXHIBIT B

**CHAPTER 5
FIRE SERVICE FEATURES**

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Section 503
Fire Apparatus Access Roads

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503.2.4 Turning Radius. The required turning radius of a fire apparatus access road shall be as specified by **2018** ASSHTO SU-40.

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503.4 Obstruction of fire apparatus access roads. Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Sections 503.2.1 and 503.2.2 shall be maintained at all times.

EXCEPTION: PUBLIC SAFETY/EMERGENCY RESPONSE VEHICLES PARKED
IN FIRE APPARATUS ACCESS ROADS WHILE ON OFFICIAL BUSINESS.

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**CHAPTER 9
FIRE PROTECTION AND LIFE SAFETY FEATURES**

SECTION 901
General

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901.4.6.2.4 ELECTRIC HORN AND STROBE. A WATER-PROOF ELECTRIC HORN AND STROBE SHALL BE INSTALLED ON THE EXTERIOR WALL ADJACENT TO THE FIRE RISER IN LIEU OF THE ELECTRIC BELL AND/OR WATER GONG AND ABOVE A WALL MOUNT FDC IF THE FDC IS IN A DIFFERENT LOCATION THAN THE RISER ROOM.

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**SECTION 903
AUTOMATIC SPRINKLER SYSTEMS**

Section 903
Automatic Sprinkler Systems

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903.2.7 Group M AND GROUP B. An automatic sprinkler system shall be provided throughout buildings containing a Group M OR GROUP B occupancy. ~~where one of the following conditions exists:~~

- ~~1. A Group M fire area exceeds 12,000 square feet (1115 m²).~~
- ~~2. A Group M fire area is located more than three stories above grade plane.~~
- ~~3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230m²).~~

4. ~~A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464m²).~~

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Section 907

Fire Alarm and Detection Systems

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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 waterflow 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.
3. NEW SHELL BUILDINGS SHALL MEET THE MINIMUM REQUIREMENTS AS FOLLOWS:
 - A. SPRINKLER SYSTEM MONITORING AND REPORTING
 - B. ONE MANUAL PULL STATION AND ONE DETECTION DEVICE IN THE SAME ROOM AS THE FACP
 - C. ONE NOTIFICATION AND ONE DETECTION DEVICE IN THE INTERIOR PORTION OF THE SHELL BUILDING UNTIL SUCH TIME AS THE LOCATION IS MODIFIED UNDER A TENANT IMPROVEMENT PERMIT
 - D. A WATERPROOF ELECTRIC HORN AND STROBE INSTALLED ON THE EXTERIOR WALL ADJACENT TO THE FIRE RISER AND ABOVE A WALL MOUNT FDC IF THE FDC IS IN A DIFFERENT LOCATION THAN THE RISER ROOM.

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907.6.1 Wiring. Wiring shall BE CLASS A AND comply with the requirements of NFPA 70 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

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907.6.3 Initiating device identification.

The fire alarm system shall identify the specific initiating device address, location, device type, floor level where applicable and status including indication of normal, alarm, trouble and supervisory status, as appropriate.

Exceptions:

~~1. FIRE ALARM SYSTEMS IN SINGLE STORY BUILDINGS LESS THAN 22,500 SQUARE FEET (2090 M2) IN AREA.~~

~~2. FIRE ALARM SYSTEMS THAT ONLY INCLUDE MANUAL FIRE ALARM BOXES, WATERFLOW INITIATING DEVICES AND NOT MORE THAN 10 ADDITIONAL ALARM INITIATING DEVICES.~~

~~31. Special initiating devices that do not support individual device identification.~~

~~42. Fire alarm systems or devices that are replacing existing equipment.~~

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~~907.6.6.3 Automatic test signal. The generation of an automatic weekly 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.~~