General

Section 501

501.1 Scope. Fire service features for buildings, structures and premises shall comply with this chapter.

501.2 Permits. A permit shall be required as set forth in Sections 105.6 and 105.7.8.

501.3 Construction documents. Construction documents for proposed fire apparatus access, location of fire lanes, security gates/barriers across fire apparatus access roads and construction documents and hydraulic calculations for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

501.4 Timing of installation. Where fire apparatus access roads or a water supply for fire protection are required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except where approved alternative methods of protection are provided. Temporary street signs shall be installed at each street intersection where construction of new roadways allows passage by vehicles in accordance with Section 505.5.

501.5 Inspection of fire apparatus access roads. Roads used for apparatus access shall be subject to field inspection and may be subject to testing using fire apparatus. The owner is responsible for any repairs necessary due to the inadequate design of the fire apparatus access road.

Section 502

Definitions

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

Agency.

Fire apparatus access road.

Fire command center.

Fire department master key.

Fire flow.

Fire lane, emergency access lane.

Key box.

Pedestrian gates.

Preemption device.

Signage.

Spread numbers.

Traffic calming devices.

Section 503

Fire apparatus access roads

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3.

The Phoenix Fire Department is the only authority authorized to designate a fire apparatus access road.

503.1.1 Buildings and facilities. Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45.72 m) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.

Exception:

1. The fire code official is authorized to increase the dimension of 150 to 350 feet (45.72 to 106.68 m) where any of the following conditions occur:

   1.1. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

   1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.

   1.3. There are not more than two Group R-3
or Group U occupancies.

2. Where approved by the fire code official, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.

3. The facility is equipped with an automatic stand-pipe system in accordance with Section 905.

503.1.2 Additional access. The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

503.1.3 High-piled storage. Fire department vehicle access to buildings used for high-piled combustible storage shall comply with the applicable provisions of Chapter 32.

503.2 Specifications. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.8 10.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm) (4267 mm).

503.2.1.1 Vehicle passing points. When fire department access roads exceed 300 feet (91 440 mm) in length, vehicle passing points shall be installed at intervals not to exceed 300 feet (91 440 mm). Vehicle passing points shall be a minimum of 30 feet (9144 mm) in width exclusive of shoulders and 50 feet (15 240 mm) in length.

Exception: When code compliant fire lanes are continuous through a property leading to an approved exit point, no passing points are required.

503.2.1.2 Loading areas and passenger drop-off areas. On private property, where fire apparatus access roads are utilized for loading or unloading or are utilized for passenger drop off or pickup, an additional 8 feet (2438 mm) of width shall be added to the fire apparatus access road. This width is in addition to the minimum 20-foot (6096 mm) access road width exclusive of shoulders. Fire apparatus access roads established and approved per Phoenix Fire Department or Planning and Development Department site plan prior to June 20, 2007 are not required to be widened if maintained and marked in accordance with this chapter.

503.2.2 Authority. The fire code official shall have the authority to require or permit modifications to the required access widths where they are inadequate for fire or rescue operations or where necessary to meet the public safety objectives of the jurisdiction.

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities in accordance with Maricopa Association of Governments standards.

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be determined by the fire code official and shall have a minimum 45-foot (13 716 mm) centerline radius [55-foot (16 764 mm) inside radius, 55-foot (16 764 mm) outside radius] on curves.

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.

503.2.6 Bridges and elevated surfaces. Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHTO HB-17. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges where required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces that are not designed for such use, approved barriers, approved signs or both shall be installed and maintained where required by the fire code official.

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 shall not exceed 15 percent (15 feet in 100 feet) (4572 mm in 30 480 mm). Cross-slope of an access road shall not exceed a depth of 6 inches (152 mm).

503.2.7.1 Drainage. Water drainage shall be directed away from or piped under the fire apparatus access roads. Ponding of water on an access road shall not exceed a depth of 6 inches (152 mm).

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall be within the limits established by the fire code official based on the fire department’s apparatus.

503.2.9 Curbs. A rolled curb meeting Maricopa Association of Governments standards or equivalent shall be installed at the entrances to fire apparatus access roads.

503.2.10 Maintenance. Fire apparatus access roads shall be maintained as approved, by the owner at all times.

503.3 Marking. Where required by the fire code official, approved signs or other approved notices or markings that include the words NO PARKING—FIRE LANE shall be
provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which fire lanes are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired where necessary to provide adequate visibility.

503.3.1 SIGNAGE. Required fire department signage shall be either .80” 3M aluminum or Arizona Department of Transportation (ADOT) approved aluminum composite material or equivalent.

503.3.2 Fire apparatus access road signs. Fire apparatus access roads less than 36 feet (10972 mm) wide shall be identified by fire lane signs and red curbs on both sides of the road as follows:

1. Signs shall be attached to an approved stationary pole set in concrete a minimum of depth of 18 inches (457 mm).
2. The bottom of each sign shall be 7 feet (2137 mm) above grade.
3. The signs shall face oncoming traffic.
4. The signs shall be set back from the curb line or sidewalk a minimum of 12 inches (305 mm) to maximum of 18 inches (457 mm).
5. Signs shall be plainly visible at all times. Vegetation or other obstructions shall be located such that a minimum 3-foot (914 mm) clearance is maintained along the line of sight.
6. Spacing of signs and marking of curbs shall be as follows:
   a. A sign shall be installed a maximum of 15 feet (4572 mm) from the beginning and end of the fire lane.
   b. When spacing between signs does not exceed 75 feet (22 860 mm), the curb on the sign side of the fire lane shall be painted red.
   c. When spacing between signs does not exceed 100 feet (30 480 mm), curb on the sign side of the fire lane shall be painted red and stenciled “FIRE LANE -- NO PARKING” midway between signs.

Exceptions:

1. A fire apparatus access road that is greater than 36 feet (10 975mm) in width require no signs or red painted curbs.
2. Fire apparatus access roads serving only Group R-3 occupancies are required to have signs and red painted curbs installed on both sides of the road when 20 feet (6096 mm) or less in width.

503.3.3 Stenciling. The fire code official is authorized to require stenciling or other permanent markings to improve the identification of fire apparatus access roads. When required, the stenciling shall state “FIRE LANE -- NO PARKING.” Lettering shall be white on a red painted curb and shall be a minimum of 3 inches (76 mm) high with ½ inch (13 mm) brush stroke.

Exception: A fire apparatus access road that is greater than 36 ft in width shall not be required to have signs and red painted curbs on either side of the fire apparatus access road.

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.

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

503.4.2 Fences and pedestrian gates. When distances from an approved fire department access road exceed the maximum distance allowed in Section 503, and fences are installed a pedestrian gate shall be provided in the fence to maintain the required fire department access. The gate shall be a minimum 4 feet (1219 mm) in width and be equipped with a key box in accordance with Section 506.

503.4.3 Other obstructions to access. When other obstructions are installed that cause the distances from an approved fire department access road to exceed the maximum distance allowed in Section 503, the fire code official is authorized to require additional fire protection as specified in Section 901.4.4.

503.5 Required gates or barricades. The fire code official is authorized to require the installation and maintenance of gates or other approved barricades across fire apparatus access roads, trails or other accessways, not including public streets, alleys or highways. 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.

503.5.1 Secured gates and barricades. Where required, gates and barricades shall be secured in an approved manner. Roads, trails and other accessways that have been closed and obstructed in the manner prescribed by Section 503.5 shall not be trespassed on or used unless authorized by the owner and the fire code official. Chains alone across a fire apparatus access road are prohibited.

Exception: The restriction on use shall not apply to public officers acting within the scope of duty.

503.6 Security gates. The installation of security gates across a fire apparatus access road shall be approved by the fire code official. Where security gates are installed, they shall have 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. Fire apparatus access gates shall be designed and installed such that they do not obstruct the egress or departure of emergency vehicles.

503.6.1 Group R-3. Where access to the primary access door is obstructed by an automatic gate in single family
detached Group R-3 occupancies a key switch shall be provided, on the exterior side. Key switch shall be identified with an approved sign reading “FD Access”.

**Exception:**
Single family residences where the primary access door is not obstructed by the restrictions of fences or gates shall not require a permit.

### 503.7 Preemption devices
Preemption devices are required on all new automatic fire access gates installed after January 1, 2001, at multi-family residential properties, gated communities with more than 2 Group R-3 occupancies, and other occupancies as required by the fire code official. Gates installed without permits or proof of installation date, require preemption devices. Voluntary installations of preemption devices shall comply with the requirements of this policy.

**Exception:** Access road serving three or fewer Group R-3 occupancies.

#### 503.7.1 Locations
The devices shall be installed such that the gate will open for both ingress and egress of emergency vehicles.

#### 503.7.2 Minimum installation standards
The installation of preemption devices shall comply with the following:

1. Detectors shall be mounted 8 feet to 10 feet (2439 mm to 3048 mm) above grade.
2. Detectors shall be located a minimum of 18 inches (457 mm) behind the gate on the property side.
3. Detectors shall be mounted on a separate 4 inch by 4 inch (102 mm to 102 mm) metal post and not on the guidepost. The metal post shall be cemented at least 18 inches (457 mm) below grade.
4. Detectors shall activate at a minimum of 150 feet (45 720 mm) from the gate.
5. Detectors shall point toward both the approach and the exit path of the emergency vehicle.
6. The sight path of the detector shall be free of visual obstructions such as signs, covered parking, canopies and vegetation.
7. Individual detectors shall be mounted together with the power module in the dual detector-mounting box. Detectors shall be approved and tested by the fire department.

### SECTION 504
ACCESS TO BUILDING OPENINGS AND ROOFS

#### 504.1 Required access
Exterior doors and openings required by this code or the International Building Code shall be maintained readily accessible for emergency access by the fire department. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided where required by the fire code official. Key boxes, keys, toggle switches and padlocks required for fire department access shall be in accordance with Section 506 and Chapter 10.

#### 504.2 Maintenance of exterior doors and openings.
Exterior doors and their function shall not be eliminated without prior approval. Exterior doors that have been rendered nonfunctional and that retain a functional door exterior appearance shall have a sign affixed to the exterior side of the door with the words THIS DOOR BLOCKED. The sign shall consist of letters having a principal stroke of not less than 7/8 inches (19.1 mm) wide and not less than 6 inches (152 mm) high on a contrasting background. Required fire department access doors shall not be obstructed or eliminated. Exit and exit access doors shall comply with Chapter 10. Access doors for high-piled combustible storage shall comply with Section 3206.6.1.

#### 504.2.1 Exterior door access
Required exterior doors shall have a key cylinder or other means to be opened from the exterior.

#### 504.2.2 Exterior stairwells
When determined by the fire code official where access is necessary for life-saving or fire-fighting purposes exterior stairwells providing access to fire protection equipment shall be marked in accordance with Section 503.3.1.

#### 504.3 Stairway access to roof
New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33 1/3 percent slope), shall be provided with a stairway to the roof. Stairway access to the roof shall be in accordance with Section 1011.12. Such stairway shall be marked at street and floor levels with a sign indicating that the stairway continues to the roof. Where roofs are used for roof gardens or for other purposes, stairways shall be provided as required for such occupancy classification.

### SECTION 505
PREMISES IDENTIFICATION

#### 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 be a minimum of 4 inches (102 mm) high with a minimum stroke width of ½ inch (12.7 mm). Numbers shall not be spelled out. Each character shall be not less than 4 inches (102 mm) high with a minimum stroke width of ½ 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, pole or other sign or means shall be used to identify the structure. Address identification shall be maintained clearly visible and free from obstructions, including landscaping, and shall be kept current.

#### 505.1.1 Residential Occupancies
Individually addressed town homes and detached single-family homes. The address numbers shall be provided and be a minimum of 4 inches (102 mm) high, with a minimum ½-inch (12.7 mm) brush stroke on a contrasting background.
505.1.1 All other residential occupancies. The address, individual building, spread, and dwelling numbers shall be in accordance with this Section.

505.1.2 Building or site address. The building or site address shall be a minimum of 12 inches (305 mm) high designation which must be clearly visible from the fire apparatus access road. The building address is required to be internally or externally illuminated.

505.1.2.1 Buildings less than 200 feet. Where buildings are more than 100 feet (30 480 mm) long and a minimum of two building address numbers shall be provided.

505.1.2.2 Building identification. Each building shall display its specific alphabetical or numerical designation which must be clearly visible from the fire apparatus access road. The building identification shall be a minimum of 18 inches (457 mm) high with a minimum 3-inch (76 mm) brush stroke on contrasting color. The building identification is required to be internally or externally illuminated.

505.1.2.3 Spread numbers. Spread numbers shall be provided adjacent to the building identification 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 a contrasting background. The spread numbers are required to be internally or externally illuminated.

505.1.2.4 Unit identification at entrances. Spread plates are required where more than one dwelling or unit is accessed from a building entrance, a spread plate is required.

505.1.2.5 Apartment or unit numbers. Individual apartment or unit numbers shall be a minimum of 4 inches (102 mm) high with a minimum ⅜-inch (9.52 mm) brush stroke on a contrasting background.

505.1.2.6 Additional identification signs. Where a building is not visible from the fire apparatus access road, a directional sign indicating the location of the unit is required.

505.1.2.7 Buildings more than 100 feet (30 480 mm) long. Where buildings are more than 100 feet (30 480 mm) long a minimum of two building address numbers shall be provided.

505.1.2.8 Buildings with multiple fire apparatus access points. Where buildings have multiple fire apparatus access points, numbers and addresses shall be provided at each access point.

505.1.3 Address Directories. When required. An approved address directory shall be provided at properties containing any one of the following:

1. More than one principal building.
2. Buildings with unit identification numbers randomly numbered or sequenced.
3. When, in the opinion of the fire code official, emergency response may be delayed due to the physical layout of the complex.

505.1.3.1 Specifications. Address directories shall be constructed and installed in accordance the following:

505.1.3.1.1 Dimensions. The number of buildings in the complex shall determine the minimum dimensions of the address directory. Minimum address directory dimensions shall be as follows:

1. Complexes containing 12 or fewer buildings require a minimum 3 by 3 feet (914 by 914 mm) [9 square feet (0.836 m2)] site directory.
2. Complexes containing 13 to 30 buildings require a minimum 4 by 4 feet (1219 by 1219 mm) [16 square feet (1.47 m2)] site directory.
For Review Only

86 PHOENIX FIRE CODE WITH 2018 IFC AMENDMENTS

FIRE SERVICE FEATURES

For Review Only

For Review Only

square feet (1.486 m²)] site directory.
3. Complexes containing 31 or more buildings require a minimum 5 by 5 feet (1524 by 1524 mm) [25 square feet (2.323 m²)] site directory.
4. Stanchions or supports shall not be included in the required size of the address directory.

505.1.3.2 Framing. Framing materials shall not encroach upon the address directory face by more than 1/2 inches (38 mm).

505.1.3.3 Protection. The address directory shall be protected against vandalism and disfigurement by a clear polycarbonate cover, which shall have a minimum thickness of ⅛-inch (3.17 mm) and be sealed to protect the directory from weather.

505.1.3.4 Illumination. Address directories shall be internally illuminated utilizing white light.

505.1.3.2 Installation requirements. Support posts or stanchions shall be set in concrete. Directories with dimensions of 3 by 3 feet (914 by 914 mm) [9 square feet (0.836 m²)] shall be mounted with the bottom of the address directory not less than 36 inches (914 mm) above grade.

505.1.3.3 Large address directories. Address directories with dimensions of 4 feet by 4 feet (1219 by 1219 mm) [16 square feet (1.486 m²)] and 5 feet by 5 feet (1524 by 1524 mm) [25 square feet (2.323 m²)] shall be mounted with the bottom of the address directory not less than 24 inches (610 mm) above grade.

505.1.3.4 Depictions. All depictions must be clear, easily understood, and legible at a distance of 8 feet (2438 mm). The address directory shall depict structures, building numbers, units, apartment or space numbers, tennis courts, swimming pools, elevators, driveways, streets, laundry rooms, fire hydrants, fire apparatus access roads and other features as determined by the fire department. The depictions shall comply with the following:

1. Address directories shall be a dark print on a contrasting light background. Buildings shown on the address directory shall not be the same color as other features indicated on the address directory.
2. The name and address of the complex are required and shall not exceed 10 percent of the total size of the site directory.
3. Swimming pools, canals, and waterway areas shall be translucent blue.
4. Tennis courts and recreational courts shall be translucent green.
5. Fire hydrants shall be a ¾-inch (6.35 mm) diameter black circle filled in with a translucent yellow center. The abbreviation “HYD” must be affixed by the location of the fire hydrant on the address directory.

6. The address directory shall be properly oriented to the viewer with a red dot that is 1 inch (25 mm) in diameter, that is with the words “YOU ARE HERE” affixed at the appropriate location on the address directory.
7. A north arrow shall be included in the upper-right quadrant of the address directory. The arrow shall be a minimum of 3 inches (76 mm) in length with a minimum 1-inch (25 mm) brush stroke.
8. Interior fire apparatus access roads, where provided, shall be marked on the address directory with red crosshatching.

505.1.3.5 Setbacks. The address directory shall be installed on the occupancy’s property, at locations approved by the fire department. Placement of the address directory shall be as follows:

1. The address directory shall be set back from the street or curbing at least 25 feet (7620 mm) to allow emergency vehicles to clear the public right-of-way.
2. Shall not exceed a distance of 4 feet (1219 mm) from the edge of the fire apparatus access road facing the direction of oncoming traffic.
3. Shall not conflict with traffic visibility zones as provided for by other ordinances.
4. Shall be immediately visible and free from obstructions including architectural design and landscaping.

505.1.3.6 Prohibitions. Information such as advertising or additional art work shall not be allowed on the address directory.

505.2 Street or road signs. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new road-approved size, weather resistant and be maintained until replaced by permanent signs.

SECTION 506
KEY BOXES

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 fire-fighting purposes, or when buildings are monitored off-site for security, fire or other service that notifies the fire department, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be compatible with an existing rapid entry key box system in use in the jurisdiction and approved by the fire code official. The key box shall be of an approved type listed in accordance with UL1037, and shall contain keys, toggle switch or other devices to gain necessary access as required by the fire code official.

Exception: Group R-3 Occupancies.
506.1.1 Locks. An approved lock shall be installed on gates or similar barriers where required by the fire code official.

506.1.2 Key boxes for nonstandardized fire service elevator keys. Key boxes provided for nonstandardized fire service elevator keys shall comply with Section 506.1 and all of the following:

1. The key box shall be compatible with an existing rapid entry key box system in use in the jurisdiction and approved by the fire code official.

2. The front cover shall be permanently labeled with the words "Fire Department Use Only-Elevator Keys."

3. The key box shall be mounted at each elevator bank at the lobby nearest to the lowest level of fire department access.

4. The key box shall be mounted 5 feet 6 inches (1676 mm) above the finished floor to the right side of the elevator bank.

5. Contents of the key box are limited to fire service elevator keys. Additional elevator access tools, keys and information pertinent to emergency planning or elevator access shall be permitted where authorized by the fire code official.

6. In buildings with two or more elevator banks, a single key box shall be permitted to be used when such elevator banks are separated by not more than 30 feet (9144 mm). Additional key boxes shall be provided for each individual elevator or elevator bank separated by more than 30 feet (9144 mm).

   Exception: A single key box shall be permitted to be located adjacent to a fire command center or the non-standard fire service elevator key shall be permitted to be secured in a key box used for other purposes and located in accordance with Section 506.1.

506.1.3 Key box installation height. The key box shall be mounted between 4 to 5½ feet (1219 mm to 1677 mm) above grade.

506.1.4 Visibility. The key box shall be illuminated to be immediately visible to fire personnel from the emergency apparatus. Posts, fences, vehicles, growth, trash, storage, and other materials shall not be placed or kept near key boxes in a manner that would prevent the key boxes from being immediately discernible.

506.1.5 Marking of keys for fire department access. Keys that are required to access secured areas for a function not listed below, shall be provided with water-resistant tags. The tags shall be marked in a contrasting color with the key’s function and room number. The terminology used to mark the tags shall provide immediate understanding as to the key function.

   Each key shall be color-coded to identify its function as follows:

   1. Green for access gates.

   2. Yellow for elevators.

   3. Red for the Fire Command Center.

   4. Blue for keys related to water access (e.g., gates to swimming pools).

   5. White for master keys.

506.1.6 Number of sets of keys. All keys shall be provided in full sets a minimum of 3 sets for access shall be provided. Buildings with stairways shall provide an additional 3 sets per stairway. Buildings with elevators shall provide an additional 3 sets per fire service designated elevator.

506.1.7 Swimming pool gates. All pedestrian gates in multi-family and commercial occupancies that provide access to swimming pools, and are locked shall be provided with an approved key box in accordance with Section 506. If a card reader system is installed a Phoenix Fire Department key box with a toggle switch must be installed.

506.2 Key box maintenance. The operator of the building shall immediately notify the fire code official and provide the new key where a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

SECTION 507
FIRE PROTECTION WATER SUPPLIES

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 on site upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. Water supplies for manual fire suppression and fire hydrants shall be in accordance with Appendix B.

507.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

507.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.

507.2.2 Fire mains. Fire 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 not be less than 8 inches (203 mm) in diameter unless calculations determine otherwise.

507.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method.

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

507.3.2 Minimum standards. When a water supply for fire protection is not available from the City of Phoenix, or if the flow rate, pressure, or duration of the water supply available from the city does not meet the minimum requirements of the Phoenix Fire code, the owner shall be responsible for installing all the infrastructure required to meet the fire flow, pressure, and duration requirements of the Phoenix Fire code.

507.3.3 Failure to maintain water supply. Failure to provide and maintain water supply. Failure to provide and maintain the required water supply necessary for fire protection shall be considered a hazard to life or property and is subject to enforcement under Section 104 of the Phoenix Fire code.

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

507.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6.

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 (121 920 mm) from a building, on-site fire hydrants and mains shall be provided.

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

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

507.5.1.2 City of Phoenix hydrant specifications.

507.5.1.2.1 Phoenix threads. Fire hydrants shall be provided with Phoenix threads.

507.5.1.2.2 Color of hydrants. The color of hydrants shall be Maricopa Association of Government Standards, standard fire hydrant yellow. Private fire hydrants shall have the bonnet painted reflective white. Hydrants not intended for fire department use shall have the bonnet painted black. The red bonnet indicates a hydrant coming off a substandard main, or a low flow hydrant, normally coming off a 4-inch (101 mm) feed.

507.5.1.2.3 Height. Fire hydrants shall be installed so that the centerline of the lowest outlet is not less than 18 inches (457 mm) above grade and the highest outlet does not exceed 30 inches (762 mm) above grade.

507.5.1.2.4 Hydrant location. New hydrants shall be located on the right-hand (passenger) side of the street. Fire hydrants shall be located not less than 1 foot (305 mm) and not more than 6 feet (1829 mm) from the back of the curb of the access road or other vehicle access point. The largest outlet on the hydrant shall face the access road.

507.5.1.2.5 Hydrants on major streets. Fire hydrants on major streets, collector streets, or any other streets that are not divided by raised median islands or light-rail tracks can be included in the coverage analysis. If those streets classes are divided by raised median islands or light-rail tracks, then the existing hydrant can only be included in the coverage analysis if its location is on the same side of the median as the new development.

507.5.1.2.6 First new hydrant. The first new fire hydrant shall be located at the street intersection or at the main entrance(s) into a subdivision, apartment complex or commercial development.

507.5.1.2.7 Additional hydrants. Additional hydrants shall be spaced approximately 500 feet (152 400 mm) apart in single-family residential developments and shall be approximately 300 feet (91 440 mm) apart in all other development types. The distance between hydrants shall be measured along the path of the fire apparatus access road.

507.5.1.2.8 Parking areas. In open-air, on-grade parking areas, at least one fire hydrant shall be located within 600 feet (182 800 mm) of all areas.

507.5.1.2.9 Distance. Distance to fire department connection (FDC). At least one fire hydrant shall be located within 200 feet (60 960 mm) of a FDC supplying building fire protection systems. The distance between the hydrant and FDC shall be measured along the path of the fire apparatus access road and as fire fighters would lay hose. See also section 912.

507.5.1.2.10 Tampering and obstructions. Vehicle parking shall be prohibited within 15 feet (4572 mm) in either direction, of a fire hydrant installed parallel to a curb line. For hydrants that are set back from the curb, the 15-foot (4572 mm) clearance shall be measured from the curb line.

507.5.1.2.11 Accessibility. Fire hydrants shall be accessible to the fire department apparatus by roads meeting the requirements of Section 503. The largest outlet on the hydrant shall face the fire apparatus access road.

507.5.1.2.12 Sectional valves. Sectional valves shall be provided to ensure minimal impairments to fire protection should any mains require repair or alteration.

1. Every looped private main shall have backflow prevention serving a minimum two sectional valves at the point of connection on each leg of the loop and a minimum of one sectional valve separating the supply line in two approximately equal sections.
The backflow valve assembly can serve as a sectional valve.

2. One sectional valve shall be placed on the private main supply to isolate every four to six connections to either sprinkler systems or hydrants, which each sprinkler lead-in and hydrant feed require their own control valves by NFPA 13 and NFPA 24. When a large private fire main has six or more connections to the main, multiple sectional valves are required to minimize impairments.

3. The backflow supply valve installed on connection from City of Phoenix public water mains is required outside the City of Phoenix right-of-way. The backflow valve assembly may serve as the fire sprinkler connection valve only for a dedicated sprinkler system supply.

4. If the sprinkler riser supply piping is run more than 5 feet (1524 mm) under the building, a Post Indicator Valve (PIV) shall be provided adjacent to the foundation, within 25 feet (7620 mm) to isolate the pipe running under the foundation.

507.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with approved standards. Records of tests and required maintenance shall be maintained.

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants of all types: Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

Records of tests and required maintenance shall be maintained.

507.5.4 Obstruction. Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

507.5.5 Clear space around hydrants. A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants, except as otherwise required or approved.

507.5.6 Physical protection. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall comply with Section 312.

SECTION 508

FIRE COMMAND CENTER

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

508.1.1 Location, access and identification. The location and accessibility of the fire command center shall be approved by the fire code official. The fire command center shall be identified by permanent easily visible sign noting “Fire Department Command Center” located on the door to the fire command center.

508.1.2 Separation. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 707 of the International Building Code or horizontal assembly constructed in accordance with Section 711 of the International Building Code, or both.

508.1.3 Size. The fire command center shall be not less than 0.015 percent of the total building area of the facility served or 200 square feet (19 m²) in area, whichever is greater, with a minimum dimension of 0.7 times the square root of the room area or 10 feet (3048 mm), whichever is greater.

508.1.4 Layout approval. A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation.

508.1.5 Storage. Storage unrelated to operation of the fire command center shall be prohibited.

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

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The firefighter’s control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking interior exit stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress,
FIRE SERVICE FEATURES

fire protection systems, fire-fighter air-replenishment systems firefighting equipment and fire department access, and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.

13. An approved Building Information Card that includes, but is not limited to, all of the following information:

13.1. General building information that includes: property name, address, the number of floors in the building (above and below grade), use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and the estimated building population during the day, night and weekend;

13.2. Building emergency contact information that includes: a list of the building’s emergency contacts including but not limited to building manager, building engineer, fire alarm and sprinkler contractor, security system contractor, and elevator contractor and their respective work phone number, cell phone number and e-mail address;

13.3 Building construction information that includes: the type of building construction including but not limited to, floors, walls, columns, and roof assembly;

13.4 Exit access stairway and exit stairway information that includes: number of access stairways and exit stairways in the building, each access stairways and exit stairways designation and floors served; location where each exit stair access stairways and exit stairways discharges, stairways that are pressurized, exit stairways provided with emergency lighting, each exit stairway that allows reentry; exit stairways providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby, location of freight elevator banks;

13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service;

13.6. Fire protection system information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of automatic sprinkler systems installed including but not limited to dry, wet and pre-action;

13.7. Hazardous material information that includes: location of hazardous material and quantity of hazardous material.


15. Generator supervision devices, manual start and transfer features.

16. Public address system, where specifically required by other sections of this code.

17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.

18. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

19. A key box shall be permanently installed near the door to the fire command center. The key box shall be located 4 to 5½ feet (1219 mm to 1677 mm) above grade in a clearly visible location, with a minimum of 6 and a maximum of 8 sets of keys, unless additional keys are required by the fire code official.

SECTION 509
FIRE PROTECTION AND UTILITY EQUIPMENT
IDENTIFICATION AND ACCESS

509.1 Identification. Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

509.1.1 Utility identification. Where required by the fire code official, gas shutoff valves, electric meters, service switches and other utility equipment shall be clearly and legibly marked to identify the unit or space that it serves. Identification shall be made in an approved manner, readily visible and shall be maintained.

509.2 Equipment access. Approved access shall be provided and maintained for all fire protection equipment to permit immediate safe operation and maintenance of such equipment. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from being readily accessible.

SECTION 510
EMERGENCY RESPONDER RADIO COVERAGE

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.

Exceptions:

1. Where approved by the building official and the fire code official, a wired communication system in
accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an approved radio coverage system.

2. Where it is determined by the fire code official that the radio coverage system is not needed.

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.

510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with approved radio coverage for emergency responders as required in Chapter 11.

510.3 Permit required. A construction permit for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.5. Maintenance performed in accordance with this code is not considered a modification specified in Section 105.7.5. Maintenance performed in accordance with Section 907.2.13.2 shall be automatically activated emergency responder radio coverage system.

510.4 Technical requirements. Systems, components and equipment required to provide the emergency responder radio coverage system shall comply with Sections 510.4.1 through 510.4.2.8.

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have acceptable emergency responder radio coverage where 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.

510.4.1.1 Minimum signal strength into the building. The minimum inbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The inbound signal level shall be sufficient to provide not less than a 3.0 or an equivalent Signal-to-InterferencePlus-Noise Ratio (SINR) applicable to the technology for either analog or digital signals.

510.4.1.2 Minimum signal strength out of the building. The minimum outbound signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The outbound signal level shall be sufficient to provide not less than a DAQ of 3.0 or an equivalent SINR applicable to the technology for either analog or digital signals.

510.4.1.3 System performance. Signal strength shall be sufficient to meet the requirements of the applications being utilized by public safety for emergency operations through the coverage area as specified by the fire code official in Section 510.4.2.2.

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 and NFPA 1221.

510.4.2.1 Amplification systems and components. Buildings and structures that cannot support the required level of radio coverage shall be equipped with 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.

510.4.2.2 Technical criteria. The fire code official shall maintain a document providing the specific technical information and requirements for the emergency responder communications coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.

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 hours.

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 higherrated 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.

5. Bi-Directional Amplifiers (BDAs) used in emergency 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).
4. Failure of active RF-emitting device(s).
5. Low-battery capacity at 70-percent reduction of operating capacity.
6. Failure of critical system components.
7. The communications link between the fire alarm system and the emergency responder radio enhancement system.

510.4.2.6 Additional frequencies and change of frequencies. The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority.

510.4.2.7 Design documents. The fire code official shall have the authority to require “as-built” design documents and specifications for emergency responder communications coverage systems. The documents shall be in a format acceptable to the fire code official.

510.4.2.8 Radio communication antenna density. Systems shall be engineered to minimize the nearfar effect. Radio enhancement system designs shall include sufficient antenna density to address reduced gain conditions.

Exceptions:
1. Class A narrow band signal booster devices with independent AGC/ALC circuits per channel.
2. Systems where all portable devices within the same band use active power control features.

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

510.5.1 Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety agency by the FCC or other radio licensing authority shall not be installed without prior coordination and approval of the fire code official.

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

1. A valid FCC-issued general radio operator’s license.
2. Certification of in-building system training issued by an approved organization, or approved school or certificate issued by the manufacturer of the equipment being installed.

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

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

1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency’s radio communications system or equipment approved by the fire code official.
3. Failure of not more than one test area shall not result in failure of the test.
4. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 95-percent coverage requirement.
5. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency’s radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and subsequent annual inspections.
8. Systems incorporating Class B signal-booster devices or Class B broadband fiber remote devices shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.1.1 and 510.4.1.2.

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

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

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

1. In-building coverage test as described in Section 510.5.3.
2. Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.
4. Other active components shall be checked to verify operation within the manufacturer’s specifications.
5. At the conclusion of the testing, a report, which shall verify compliance with Section 510.5.3, shall be submitted to the fire code official.

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

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

510.6.3 Nonpublic safety system. Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the emergency responder communications coverage system, the nonpublic safety amplification system shall be corrected or removed.

SECTION 511
HILLSIDE DEVELOPMENT

511.1 Sprinkler requirement. An automatic sprinkler system shall be installed in Group R-3 and R-4 occupancies on hillside areas where the gradient for a fire apparatus access road exceed 15 percent, or hydrant spacing does not comply with this Section 508.4, or a reliable water supply is not available.

Group R-4 occupancies up to four stories in height shall require a minimum NFPA 13R automatic sprinkler system to be installed.

Group R-3 occupancies, one-and two-family dwellings and manufactured homes, shall require a minimum NFPA 13D automatic sprinkler system to be installed.

SECTION 512
CONTROLLED ACCESS/SECURITY GATES OR BARRIERS

512.1 General. The installation of controlled access/security gates or barriers across a fire apparatus access road shall be approved by the fire code official and meet the requirements of Section 512.

512.1.1 Permits. Permits shall be required to install or modify controlled access gates.

512.1.2 Gate installation companies. When gates are installed at any location that obstructs a fire apparatus access road, the installing company shall be licensed by the Arizona Registrar of Contractors as L-5 or C-5.

512.1.3 Egress. Fire apparatus access/security gates or barriers shall be designed and installed such that they do not obstruct the egress or departure of emergency vehicles.

512.1.3.1 Pedestrian gates. Pedestrian gates installed as part of the means of egress shall comply with the Phoenix Building Code and Chapter 10 of this code.

512.1.4 Maintenance. All fire apparatus access gates shall be maintained operable at all times and shall be inspected at least annually. Copies of the annual inspection report shall be maintained and be accessible for fire department review.

512.1.5 Inoperable gates. Controlled access gates that are inoperable and impede the entrance of fire apparatus shall be chained open or removed at the owner’s expense.

512.1.6 Illegal gates. Controlled access gates that cross fire apparatus access roads that have been installed without a permit shall be chained open or removed at the owner’s or installing contractor’s expense until
a permit and final approval has been obtained from the fire department.

512.2 Fire apparatus access gates.

512.2.1 General. Access openings are required to be automatic where no turnaround is provided for fire apparatus.

512.2.2 Main entrance identification. Access openings shall have signs that identify the location of the property’s primary entrance, and signs shall be bolted on the street side of the fire apparatus access gate (see Appendix D).

512.2.3 Marking and signage. Manual and automatic access openings are required to be marked in accordance with Section 512.3.5. Signage shall be provided in accordance with Section 512.5.2.

512.3 Controlled access gate specifications. When controlled access gates are installed across a fire apparatus access road the specifications in Section 512.2 shall apply.

512.3.1 Opening width. When the gate is fully opened, a minimum 20-foot (6096 mm) clear width shall be provided for both the entrance and exit gates. Gates installed and approved prior to Nov. 8, 2003, shall be maintained in accordance with the original approval. The fire code official shall require additional width opening when a 45-foot (13 716 mm) fire apparatus turning radius cannot be met.

Exception: Access roads serving three or fewer Group R-3 occupancies within 350 feet (106 680 mm) from the street to each residence’s main entrance, as the fire fighters travel shall be exempt from the requirement of 20 feet (6096 mm).

512.3.2 Electric and solar voltaic power system operated gates. Electric and solar operated gates shall be installed in accordance with this section.

512.3.2.1 Standby power systems. Electric and solar operated gates shall be provided with a standby power system. Standby power is permitted to be, but not limited to, battery back-up or connection to an emergency generator. The activation of the system shall open gates and maintain them in the open position until primary power is restored to the system. Standby power systems are required to comply with the National Electrical Code Article 701.

Exception: Controlled access gates installed at occupancies other than multifamily residential properties may remain closed until the emergency gate switch is activated and shall then remain open while the standby power system is operating the gate.

512.3.3 Opening time. Electric and solar operated controlled access gates shall open at a minimum rate of 1 foot per second (0.305 m/s).

512.3.4 Key switch. Each electric and solar operated controlled access gate shall be equipped with an approved key switch on both sides of the gate. When separate entry and exit gates are provided, the emergency key switch shall open the entrance and exit gates.

512.3.5 Key switch identification. An approved sign reading “F.D. ACCESS” shall be installed within 12 inches (305 mm) of the emergency key switch. The key switch shall be illuminated so as to be visible from fire apparatus (see Appendix D).

511.3.6 Height. The key switch shall be mounted between 5 ½ and 6 feet (1676 to 1829 mm) above grade.
511.3.6.1 Solar photovoltaic cell location. The solar cell shall be located a minimum of 7 feet (2133 mm) above grade. The photovoltaic cell shall be located on the 4 by 4-inch preemption post as shown in the solar powered gate detail (see Appendix D).

511.3.7 Obstruction and impairment. Posts, fences, vehicles, growth, trash, storage and other materials shall not be kept near key switches in a manner that would prevent the key switches from being visible.

511.3.8 Bypass of systems. When activated, the emergency key switch shall bypass all occupant and loop switch systems.

511.4 Preemption devices. Preemption devices are required on all new automatic fire access gates installed after Jan. 1, 2001, at residential properties. Gates installed without permits or proof of installation date require preemption devices. Voluntary installations of preemption devices shall comply with the requirements of Section 511.4.2.

**Exception:** Access road serving three or fewer Group R-3 occupancies.

511.4.1 Locations. The devices shall be installed such that the gate will open for both ingress and egress of emergency vehicles.

511.4.2 Minimum installation standards. The installation of preemption devices shall comply with the following:

1. Detectors shall be mounted 8 to 10 feet (2439 to 3048 mm) above grade.
2. Detectors shall be located a minimum of 18 inches (457 mm) behind the gate on the property side.
3. Detectors shall be mounted on a separate 4 by 4-inch (102 to 102 mm) metal post and not on the guide post. The metal post shall be cemented a minimum of 18 inches (457 mm) below grade.
4. Detectors shall activate at a minimum of 150 feet (45 720 mm) from the gate.
5. Detectors shall point toward both the approach and the exit path of the emergency vehicle.
6. The sight path of the detector shall be free of visual obstructions such as signs, covered parking, canopies and vegetation.
7. Individual detectors shall be mounted together with the power module in the dual detector-mounting box. Detectors shall be approved by the fire department. A list of approved devices will be maintained by the fire department and available to the public.

511.5 Manual controlled access gates. Manual controlled access gates that cross fire apparatus access roads or other roads that, when determined by the fire code official, provide access to areas where immediate access is necessary for lifesaving or fire-fighting purposes shall comply with Section 511.3

511.5.1 Locking mechanism. All manual controlled access gates that cross a fire apparatus access road shall use an approved dual padlock mechanism (see Appendix D). Gates installed and approved prior to Nov. 8, 2003, shall be maintained in accordance with the original approval.

511.5.2 Signs. Approved signs shall be provided on the manual gates. The signs shall have a reflective background and shall be bolted back-to-back onto each side of the gate (see Appendix D).

511.5.3 Marking. Minimum 6-inch (152 mm) wide red, crosshatched striping shall be painted on the ground surface on both sides of the manual access gate, including recessed areas as determined by the fire department. A minimum of two applications of paint is required.
BUILDING NUMBERS AND UNIT SPREAD NUMBERS

18" BLDG. NUMBER
3" STROKE

7" X 1"

7" LETTERS
1" STROKE

27.5"

42"

ALL NUMBERING IS GILL SANS FONT

NOTE:
1. THE FONT USED IS GILL SANS. FONTS USED FOR ADDRESSING MUST BE LEGIBLE AND EASY TO READ.

2. THE USE OF DIFFERENT FONTS MUST BE PRE-APPROVED BY A FIRE CODE OFFICIAL.
UNIT DIRECTIONAL SIGN

NOTES:
1. THE SIGN FACE SHALL BE 32" X 24" AND FABRICATED FROM .080 ALUMINUM SHEET WITH 1/2" RADIUS CORNERS.
2. THE FONT USED IS ARIAL BLACK. FONTS USED FOR ADDRESSING MUST BE LEGIBLE AND EASY TO READ. THE USE OF DIFFERENT FONTS MUST BE PRE-APPROVED BY A FIRE PREVENTION EMERGENCY ACCESS OFFICER.
3. THE SIGN FACE SHALL HAVE A WHITE 3M DIAMOND GRADE REFLECTIVE SHEETING (DG3 4090 SERIES OR EQUIVALENT) APPLIED AS A BACKGROUND TO THE ALUMINUM PLATES.
4. LETTERING / GRAPHICS SHALL BE DARK CONTRASTING, 3M SCOTCHLITE ACRYLIC, TRANSPARENT, ELECTRONIC CUTTABLE FILM (3M 1170 SERIES) INVERSE CUT TO ALLOW WHITE REFLECTIVE BACKGROUND TO SHOW THROUGH.
5. ALL SIGN IMAGING SHALL BE IN COMPLIANCE WITH THE REFLECTIVE SHEETING MANUFACTURES MATCH COMPONENT SYSTEM.
6. TO FORM A GRAFFITI BARRIER 3M 180 PROTECTION OVERLAY FILM MAYBE APPLIED OVER SIGN.
7. REQUIRES PRE-APPROVAL BY A FIRE CODE OFFICIAL. 602-262-6771
Notes:

1. Should include photo cell.
2. Refer to entrance island detail for dimension specifications
ENTRANCE ISLAND TO RESIDENTIAL COMMUNITIES WITH AUTOMATIC GATES

SITE DIRECTORY REQUIRES PRE-APPROVAL

APARTMENT DIRECTORY

ENTRANCE ISLAND ELEV. DETAIL (FRONT VIEW)

ACCESS SIGN DETAIL

F.D. KNOX KEY SWITCH REQUIRES PERMIT

F.D. KNOX KEY SWITCH FOR SINGLE GATE APPLICATION SWITCH MODEL #3602
FOR DOUBLE GATE APPLICATION SWITCH MODEL #3613

ACCESSPADS ELEV. DETAIL (SIDE VIEW)

F.D. KNOX KEY SWITCH

TENANT KEY PAD

PLAN VIEW

ACCESS PADS ELEV. DETAIL (SIDE VIEW)

TENANT KEY PAD

GRADE / PAVEMENT