CITY OF CHESAPEAKE
PUBLIC FACILITIES MANUAL
FIRE PROTECTION SECTION

I. INTRODUCTION

A. The Fire Department's role in the development plan review process is to ensure that the effects of an emergency situation can be prevented and/or minimized through proper application of code requirements, both before and after construction, to ensure life safety and property protection. The following is a brief outline of the areas that the Fire Prevention Division is concerned with in this process:

1. **Emergency Access** – Emergency access and egress within the facility site or structure(s) for both occupant and emergency personnel safety, and to conduct effective firefighting and other emergency services operations utilizing apparatus, personnel and equipment (fire engines, ladder trucks, ambulance units, etc.).

2. **Water Supplies for Firefighting** – Adequate supply of water for manual firefighting operations via properly spaced fire hydrants, or approved alternate water supplies when municipal supply is not available, meeting fire flow requirements of the facility or structure (s) to be protected.

3. **Fire Protection Systems** –Fire protection systems, mostly automatic, that are required by code such as fire sprinklers and standpipe systems, fire alarms, commercial cooking suppression systems, etc.

4. **Hazardous Processes** – Any special requirements, permits, or needs for additional equipment created due to a hazardous process occurring in, or outside, of a structure(s) or facility, potentially adversely affecting the occupants, responding emergency personnel, or the community.

B. All plans submitted for review shall meet all applicable Building and Fire Prevention Codes and referenced standards for the City of Chesapeake, and shall include the requirements of the Public Facilities Manual (PFM) contained herein. All modification requests to these codes and this policy shall be requested in writing. Modifications shall not be granted until written approvals have been received from the appropriate building and/or fire code official.

C. The requirements in this portion of the Public Facility Manual are based upon the following references:

1) The Virginia Uniformed Statewide Building Code (USBC)* as amended by the Commonwealth of Virginia **, and referenced standards+.
2) The Commentary for the 2000 Edition of the International Building Code*

3) The Virginia Statewide Fire Prevention Code (SFPC)* as amended by the Commonwealth of Virginia**, as amended by the City of Chesapeake++, and referenced standards+.

4) The 2000 edition of the International Fire Code (IFC)*

5) The Commentary for the 2000 Edition of the International Fire Code*

* Recommended reference material including referenced standards, for any architect, engineer, fire protection contractor, or facilities manager, agent or owner. These references can be purchased by contacting the **International Code Council** at 800-214-4321, or online at www.iccsafe.org

** The Virginia amendments to Building and Fire Codes can be obtained from the VA Dept. of Housing and Community Development (DHCD) online at:
Building Code Amendments -
www.dhcd.virginia.gov/StateBuildingCodesandRegulations/Virginia_Uniform_Statewide_Building_Code.htm
Fire Code Amendments –
www.dhcd.virginia.gov/StateFireMarshalsOffice/PDFs/Virginia_Statewide_Fire_Prevention_Code.pdf

+Referenced Standards are recognized industry standards such as National Fire Protection Association (NFPA) , Underwriters Laboratory (UL), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM), US Department of Transportation (DOTn), and American Petroleum Institute (API), to name a few. Assistance purchasing referenced standards can be obtained also by contacting the International Code Council listed above, and is recommended reference material as may be pertinent.

++May be obtained online at the City of Chesapeake web site at www.cityofchesapeake.net/

D. All requirements within the Fire Department portion of the PFM also include the reference numbers utilized in the SFPC, USBC and/or the IFC). It is highly recommended that anyone submitting a plan for review should obtain a copy of the reference material since the PFM is paraphrased and may not include all useful and applicable information such as definitions and/or tables.

II. USE GROUP

A. All requirements set forth in this document and at the core of all plan reviews conducted by the Fire Department are driven by the “Use Group” of structures as defined by the USBC. A brief description of Use Groups are as follows:

1. **Assembly Group A**. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering together of persons for purposes such as civic, social or religious functions, recreation, food or drink consumption or awaiting transportation. A room or space used for assembly purposes by less than 50 persons and accessory to another occupancy shall be included as a part of that occupancy. Assembly occupancies shall include the following:

    - A-1 Assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures.
    - A-2 Assembly uses intended for food and/or drink consumption.
    - A-3 Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A.
    - A-4 Assembly uses intended for viewing of indoor sporting events and activities with spectator seating.
    - A-5 Assembly uses intended for participation in, or viewing, outdoor activities.

2. **Business Group B.** Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions.

3. **Educational Group E**. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

    - Day care. The use of a building or structure, or portion thereof, for educational, supervision or personal care services for more than five children older than 21/2 years of age, shall be classified as a Group E occupancy.

4. **Factory Industrial Group F**. Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous occupancy.

    - Factory Industrial F-1 Moderate-Hazard Occupancy. Factory Industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F- 1 Moderate Hazard.
    - Factory Industrial F-2 Low-Hazard Occupancy. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials which during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies.

5. **Hazardous Group H**. Hazardous Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowable as found in USBC Tables 307.7(1) and 307.7(2). H use groups are further classified as H-1, H-2, H-3, H-4, and H-5 according to degree of hazard.

6. **Institutional Group I**. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be further classified as Group I-1, I-2, I-3 or I-4.

   - Group I-1. This occupancy shall include a building or part thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff.
   - Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care on a 24-hour basis of more than five persons who are not capable of self-preservation.
   - Child care facility**.** A child care facility that provides care on a 24-hour basis to more than five children 21/2 years of age or less shall be classified as Group I-2.
   - Group I-3. This occupancy shall include buildings and structures that are inhabited by more than five persons who are under restraint or security. An I-3 facility is occupied by persons who are generally incapable of self-preservation due to security measures not under the occupants' control.
   - Group I-4, day care facilities. This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage, or adoption, and in a place other than the home of the person cared for. A facility such as the above with five or fewer persons shall be classified as a Group R-3. Places of worship during religious functions are not included.

7. **Mercantile Group M.** Mercantile Group M occupancy includes, among others, buildings and structures or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public.

8. **Residential Group R.** Residential Group R occupancy includes, among others, the use of a building or structure or a portion thereof, for sleeping

accommodations when not classed as an Institutional Group I. Residential occupancies shall include the following:

- R-1 Residential occupancies where the occupants are primarily transient in nature (less than 30 days).
- R-2 Residential occupancies containing more than two dwelling units where the occupants are primarily permanent in nature.
- R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as R-1, R-2 or I and where buildings do not contain more than two dwelling units, or adult and child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- R-4 Residential occupancies shall include buildings arranged for occupancy as Residential Care/Assisted Living Facilities including more than five but not more than 16 occupants, excluding staff.

9. **Storage Group S.** Storage Group S occupancy includes among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy, and shall be further classified as follows.

- Moderate-hazard storage**,** Group S-1. Buildings occupied for storage uses which are not classified as Group S-2, but which are considered combustible and burn moderately.
- Low-hazard storage, Group S-2. Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products may have a negligible amount of plastic trim such as knobs, handles or film wrapping.

10. **Utility and Miscellaneous Group U** - Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy.

III. FIRE SERVICE AND PROTECTION FEATURES

A. EMERGENCY ACCESS

1. SFPC Section 501 – General

a. **(SFPC) 501.3 Construction documents**. Construction documents for proposed fire apparatus access, location of fire lanes and construction documents and hydraulic calculations for fire hydrant systems or other fire protection systems,

shall be submitted to the fire department for review and approval prior to construction or installation. Construction documents must be drawn to scale, to clearly show the details that address the requirements of the USBC, SFPC and all referenced standards.

b. **(SFPC) 501.4 Timing of installation**. When fire apparatus access roads or a water supply for fire protection is required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except when approved (by the fire code official) alternative methods of protection are provided. Buildings under construction are quite vulnerable to fire and other types of construction incidents. Access roads and water for fire protection are essential for fire fighting purposes. Temporary street signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles in accordance with Section 505.2 of the SFPC. Temporary street signs are also valuable to emergency responders because the streets in new developments will most likely not be familiar to the emergency responders, nor will they be on their maps. Marked access roads and an emergency water supply should be in place before any large amount of combustible building material is placed on site and before any construction is initiated.

2. **SFPC Section 503 - Fire Apparatus Access Roads –** SFPC definition: A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as fire lane, public street, private street, and parking lot lane and access roadway.

   a. **(SFPC) 503.1 Where required**. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3 of the SFPC and Appendix D of the IFC. Fire access roads are required to be all weather surfaced roadways that are designed for the weight and type of emergency vehicle that may use the road. No specific surface material is required for a fire access roadway. However, the road surface must comply with IFC Appendix section D102.1 (specifications) regarding minimum weight requirements. The fire code official may require additional access roads to get fire apparatus closer to fire hydrants, fire department connections (FDC's), other equipment and emergency access points.

   a-1. (**SFPC) 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. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility or any portion of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. This 150 feet requirement applies to all portions of the grade level floor of each building or facility.

- Exception: The fire code official may allow the increase of the dimension of 150 feet (45 720 mm) where:

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 of the SFPC. The fire code official will make the determination how much over 150 feet is reasonable based on the response capabilities of our emergency response units and the anticipated magnitude of the incident.

2) Fire apparatus access roads cannot be installed due to location on property, topography, waterways, CBPA, non-negotiable grades or other similar conditions, and an approved alternative means of fire protection is provided. The "alternative means" in this exception may include standpipes, automatic fire sprinklers, remote fire department connections and/or additional fire hydrants.

3) There are not more than two Group R-3 or Group U occupancies. Group R-3 occupancies noted in this exception are townhouses not over three stories high, one and two family dwellings, and adult or child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours. Group U occupancies noted in this exception are utility and miscellaneous accessory buildings.

a-2**. (SFPC) 503.1.2 Additional access**. The fire code official may 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. Additional access roads may be required based on the fire code official's knowledge of traffic patterns, local weather conditions, terrain or anticipated magnitude of the potential incident. Additional fire apparatus access roads will be further conditioned on use group or height of the structure or facility to be protected in accordance with IFC Appendix D sections as listed below.

a-2.1 **Water Access**. An all weather surface providing a minimum 12 foot width, shall be required for emergency access by fire apparatus to all significant bodies of water that present potential water rescue operations as determined by the code official. Significant bodies of water may include BMP retention/detention, lakes, borrow pits, ponds or rivers whether public or private. See PFM Volume I, Chapter V, Letter P Easements, for further details.

a-2.2 **Section (IFC) D104 - Commercial and Industrial Developments**

a-2.2.1 **(IFC) D104.1 - Buildings exceeding three stories/30 feet in height**. Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have at least three means of fire apparatus access for each structure. Because of the height of these types of structures various types of fire apparatus are often

needed. Having three means of approaching the site is necessary to manage and manipulate the increased quantity of emergency response vehicles. In cases where three fire apparatus access roads for each structure may not be possible the fire code official may allow exceptions to this requirement.

a-2.2.2 **(IFC)D104.2 - Buildings exceeding 62,000 square feet in area**. Buildings or facilities having a gross building area of more than 62,000 square feet (5760 m2) shall be provided with two separate and approved fire apparatus access roads. A large building is difficult for large fire apparatus to access quickly.

- Exception: Because of the proven track record of automatic fire sprinklers projects having a gross building area of up to 124,000 square feet (11 520 m2), pending approval of the fire code official, may have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems.

a-2.2.3 **(IFC)D104.3 Remoteness. -** Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses. This requirement is similar to how the USBC handles remoteness of exits in a building. The primary reason for this requirement is to ensure that if one access road is blocked or otherwise unavailable, another will allow access to the fire department. In cases where remoteness may not be possible the fire code official may allow exceptions to this requirement.

a-2.3 **Section (IFC) D106 - Multiple-Family Residential Developments**

a-2.3.1 **(IFC)D106.1 Projects having more than 100 dwelling units**. Multiple family residential projects having more than 100 dwelling units shall be equipped throughout with two separate and approved fire apparatus access roads.

- Exception: Projects having up to 200 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with approved automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the SFPC.

a-2.3.2 **(IFC)D106.2 Projects having more than 200 dwelling units**. Multiple-family residential projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus access roads regardless of whether they are equipped with an approved automatic sprinkler system.

a-2.4 **Section (IFC) D107 – One or Two-Family Residential Developments**

a-2.4.1 **(IFC) D107.1 One or two-family dwelling residential developments**. Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with at least two separate and approved fire apparatus access roads, and shall meet the requirements of Appendix section D104.3 of the IFC.

- Exceptions:
  1. Where there are more than 30 dwelling units on a single public or private access way and all dwelling units are protected by approved residential sprinkler systems, access from two directions shall not be required.

  2. The number of dwelling units on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with already approved future development, as determined by the fire code official.

a-3. **(SFPC) 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 23 of the SFPC.

b. **(SFPC) 503.2 Specifications**. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.7 of the SFPC and listed sections of the IFC. The dimensions of fire department access roads are based on the size and height of emergency vehicles, their turning radius, and the fact that emergency vehicles may be required to pass each other or conduct firefighting operations on the access road. Fire apparatus roads are determined by the fire code official in consideration of the use group and height of the structure or facility to be protected.

b-1. **(SFPC) 503.2.1 Dimensions**. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), except for approved security gates in accordance with Section 503.6 of the SFPC and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm). The dimensions are established to give fire apparatus continuous and unobstructed access to buildings and facilities. Twenty feet is the appropriate width needed for two average size fire apparatus to pass one another. See IFC Appendix D sections below for additional guidance and requirements on fire apparatus road dimensions.

b-1.1 **Section (IFC) D103.1 Access road width with a hydrant**. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm). See Figure D103.1 in Appendix D of the IFC. This 26 foot width provides more room for the fire department vehicle to maneuver and connect to the hydrant. In cases where a full 26-foot width may not be possible for a majority of the access road, the fire code official may allow widening of the access road for only a short distance to accommodate hydrant use.

b-1.2 **Section (IFC) D105 - Aerial Fire Apparatus Access Roads**

b-1.2.1 **(IFC) D105.1 Where required.** Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the lowest level of fire department vehicle access shall be provided with approved fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

b-1.2.2 **(IFC) D105.2 Width.** Fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm) in the immediate vicinity of any building or portion of building more than 30 feet (9144 mm) in height.

b-1.2.3 **(IFC) D105.3 Proximity to building.** At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

b-2. **(SFPC) 503.2.2 Authority**. The fire code official shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations. The requirement for greater dimensions will be based on the size and maneuverability of the anticipated emergency response apparatus.

b-3. **(SFPC) 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. See IFC Appendix D102.1 below.

b-3.1 **Section (IFC) D102.1 Access and loading**. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus byway of an approved fire apparatus access road with an asphalt, concrete or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34050kg).

b-4. **(SFPC) 503.2.4 Turning radius**. The required turning radius of a fire apparatus access road shall be determined by the fire code official. The minimum roadway turning radius shall accommodate a single unit vehicle and/or the largest piece of fire department apparatus. The minimum roadway turning radius shall be of sufficient width to provide fire department apparatus with an unobstructed path of travel, without having to drive upon curbs or leave paved surfaces which have been provided for vehicular travel.

b-5. **(SFPC) 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. This approved area for turning around fire apparatus shall be provided with width and turnaround provisions in accordance with Table D103.4 and figure D103.4 in Appendix D of the IFC.

b-6. **(SFPC) 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 Standard Specification for Highway Bridges. 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 when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the fire code official.

b-7. **(SFPC) 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. Grade shall not exceed 10 percent or a 10-foot (3048 mm) rise in a 100-foot (30 480 mm). See Appendix D of the IFC for additional guidance.

c. **(SFPC) 503.3 Marking**. Where required by the fire code official, approved signs or other approved notices shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. Signs or notices shall be maintained in a clean and legible condition at all times and shall be replaced or repaired when necessary to provide adequate visibility. Regulation posted fire apparatus access roads shall consist of the following items of delineation. Variation or modification to these requirements is subject to fire code official approval. See PFM, Appendix XIX for further detail:

c-1 Yellow reflective traffic paint applied to the curb of origin and on the adjacent curb of the fire apparatus access road to be designated, meeting required width as determined by SFPC section 503.2.1. Where no curb exists, yellow reflective paint four inches wide along the edge of pavement may be utilized to create the boundaries of the fire apparatus access road to be designated.

c-2 Within the boundaries of the fire apparatus access road designated above, the wording "NO PARKING - FIRE LANE" shall be painted with yellow reflective paint on the pavement within the area delineated. The letters used shall be a minimum of 18 inches tall consisting of a stroke width not less than 2 inches wide. The pavement posting shall be spaced a minimum of 75 feet up to 100 feet.

c-3 Signage shall be posted in accordance with IFC section D103.6 below.

c-3.1 **Section (IFC) D103.6 Signs**. Where required by the code official, fire apparatus access roads shall be marked with permanent signs as specified by the fire code official as follows, **"NO PARKING—FIRE LANE –TOWING ENFORCED-Penalty $250 Fine"**. Signs shall have a minimum dimension of 12 inches wide by 18 inches high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus access road as required in sections D103.6.1 and D103.6.2 below. Signage shall

be placed a minimum of every 75 feet but not greater than 100 feet. An inspection and approval shall be required by the fire code official, of a public or private street, if any portion thereof is required to be posted with these signs.

c-4 **Section (IFC) D103.6.1 Roads 20 to 26 feet in width**. Fire apparatus access roads and streets 26 feet wide or less shall be posted on both sides as a fire lane.

c-5 **Section (IFC) D103.6.2 Roads more than 26 feet in width**. Fire apparatus access roads more than 26 feet wide (7925 mm) to 32 feet wide (9754 mm) shall be posted, when directed by the fire code official, on one side of the road as a fire lane. Generally, fire apparatus access roads 30 feet or more provide adequate emergency access width and shall not require posting on either side as approved by the code official.

d. **(SFPC) 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 Section 503.2.1 shall be maintained at all times.

e. **(SFPC) 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 access ways, not including public or private streets, alleys or highways to prevent unauthorized vehicles from blocking or parking in the access road. The design and dimensions of the gates or barricade must be approved by the fire code official. The gate or barricade must be operable or removable by the responding emergency units.

e-1. **(SFPC) 503.5.1 Secured gates and barricades**. When required, gates and barricades shall be secured in an approved manner. Roads, trails and other access ways that have been closed and obstructed in the manner prescribed by Section 503.5 of the SFPC shall not be trespassed on or used unless authorized by the owner and the fire code official.

f. **SFPC) 503.6 Security gates**. Where security gates are installed, they shall be maintained and an approved means of emergency operation including a key box in accordance with SFPC Section 506 shall be provided and maintained. Security gates must be operable in an emergency by the emergency response units and the means of operation must be approved by the fire code official. This includes a manual method of operation for electrically operated gates. See IFC Appendix section D103.5 below:

f-1 **Section (IFC) D103.5 Fire apparatus access road gates**. Gates securing the fire apparatus access roads shall comply with **all** of the following criteria:

- The minimum gate width shall be 20 feet (6096 mm).
- Gates shall be of the swinging or sliding type.
- Construction of gates shall be of materials that allow manual operation by one person.

- Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
- Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.
- Manual opening gates shall not be locked with a padlock or chain and padlock unless they are approved by the fire code official.
- Locking device specifications shall be submitted for approval by the fire code official.

3. **SFPC Section 504 – Access to Building Openings and Roofs**

a. **(SFPC) 504.1 Required access**. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided when required by the fire code official. The USBC requires emergency access openings on one accessible side of a building unless the building is over 75 feet (22 860 mm) in depth, and then it requires an additional opening on the opposite side. If the building is equipped throughout with automatic fire sprinklers, emergency access openings are required on only one side regardless of the depth of the building. The openings must be spaced no more than 50 feet (15 240 mm) apart on each floor facing the accessible side of the building up to 75 feet (22 860 mm). Firefighters and other emergency response personnel must be able to get equipment from the apparatus to the building. Therefore, walkways are required from the apparatus access road to the required access openings on the grade level and must be approved by the fire code official.

4. **SFPC Section 505 – Premises Identification**

a. **SFPC) 505.1 Address numbers**. New buildings shall have approved (by the fire code official) address numbers, building numbers, or approved building identification placed in a position to be plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 0.5 inch (12.7 mm). Approved building identification includes the backs of buildings that face alleys or roadways. Many times the emergency response unit will be directed to the back entrance to a building; i.e., a strip shopping center. The back door of each tenant space should have the numerical address and the store name on or above the door in a manner approved by the fire code official.

b. **(SFPC) 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 roadways allows passage by vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs. The names of streets in new developments are often not on maps, and often change during the course of development making them hard for emergency

responders to find. Temporary street signs must be installed before construction begins and replaced later with permanent signs.

5. **SFPC Section 506 - KEY BOXES**

a. **(SFPC) 506.1 When 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, the fire code official is authorized to require a key box to be installed in an accessible location. The key box shall be of an approved type and shall contain keys to gain access as required by the fire code official. The height, mounting type and location of the key box shall be approved by the fire code official prior to installation. The key box shall be mounted no less than 5 feet and no more than 6 feet above grade. At a minimum, key boxes shall be required on all structures where sprinkler systems and/or fire alarms are required, and where access to fire apparatus access roads leading to exterior portions of a structure or facility are restricted by gated/fenced compounds.

a-1. **(SFPC) 506.1.1 Locks**. An approved lock shall be installed on gates or similar barriers when required by the fire code official. The key box suppliers have special padlocks and electronic-key-operated switches that are controlled by the same master key that opens the key vaults. These padlocks are required by the fire code official for security gates. The key-activated electronic switches may be required by the fire code official for the control of certain equipment in the building such as smoke control equipment or to shut down a dangerous process.

b. **(SFPC) 506.2 Key box maintenance**. The operator of the building shall immediately notify the code official and provide the new key when a lock is changed or re-keyed. The key to such lock shall be secured by the Fire Department in the key box.

6. **SFPC Section 510 – Fire Department Access to Equipment**

a. **(SFPC) 510.1 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. Fire protection equipment and appurtenances shall not be located more than 50 feet from a fire apparatus access road.

B. WATER SUPPLIES FOR FIREFIGHTING

1. **SFPC Section 508 - Fire Protection Water Supplies**

a. **(SFPC) 508.1 Required water supply**. An approved water supply capable of supplying the required manual firefighting and automatic fire suppression system

(ex. sprinklers, if any required) fire flows for fire protection shall be provided in accordance with Appendix B & C of the IFC for manual fire flows, and hydraulic calculations in accordance with NFPA 13 for automatic fire suppression systems, to protect premises upon which facilities, buildings or portions of buildings are hereafter constructed within the City of Chesapeake.

b. **(SFPC) 508.2 Type of water supply**. A municipal water supply is the required water supply if it is available. If a municipal water supply is not available the water supply utilized shall follow NFPA 1142 (Water Supplies for Suburban and Rural Fire Fighting). The water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow. A good water supply consists of an adequate source of water, a distribution system, and proper pressure for delivery. If the water source is deemed not reliable by the fire code official, it will not be considered as an acceptable water supply. In any case, water data calculations must be provided to substantiate the volume and duration of flow requirements for the water source considered.

b-1. **(SFPC) 508.2.1 Private fire service mains**. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24 and maintained in accordance with NFPA 25 and the SFPC. Appurtenances such as FDC's, fire hydrants and post indicator valves (PIV) shall be located at least 40 feet off a building and out of the potential collapse zone of any structure. PIV's are required by the fire code official, and shall be listed indicating type water control valves that serve to provide above ground notification to responding emergency personnel that water service is operational to fire suppression systems serving a particular facility or structure. These valves are required to be locked in the open position, and to be monitored for tamper in accordance with Section 903.4 of the SFPC. PIV's should be placed up line of the FDC and should never control the flow of water through the FDC intended to directly augment the sprinkler system supply by the fire department pumper.

b-2. **(SFPC) 508.2.2 Water tanks**. Water tanks for private fire protection shall be installed in accordance with NFPA 22 and the SFPC.

c. **(SFPC) 508.3 Fire flow**. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by approved methods. The term "fire flow" for PFM purposes, shall be deemed to include water demand for manual firefighting operations and automatic fire protection (ex. sprinklers) water demand. Meeting fire flow demand consists of two components. First, is the determination of both the amount of water required for manual fire fighting to extinguish a fire in a particular structure or fire area based on construction factors, occupancy type, exposures, reductions for automatic fire protection systems utilized and square footage of the fire area, along with automatic fire protection water demand, which together is referred to as <u>needed fire flow</u>. Secondly, the

amount of water available from a reliable water source to be utilized in such combined extinguishment efforts is referred to as available fire flow.

- Needed fire flow for manual fire fighting operations (includes deductions for use of any sprinklers) shall be determined in accordance with Appendix B, and table B105.1 of the IFC (see PFM, Appendix Section XVIII). In addition to fire area square footage, building construction type in accordance with the USBC, Chapter 6 must be determined to utilize the table. These construction types range from the least to the most combustible construction type, and include Type I, II, III, IV, and V respectively. Water demand for sprinkler systems shall be hydraulically calculated in accordance with NFPA 13. Manual fire flow and automatic sprinkler demand shall be added together to determine that needed fire flow for a particular site can be met by available water flow.

- Available fire flow is defined as the flow rate of a water supply available at the site, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for manual and automatic suppression system fire fighting. This combination of water demand must be met to ensure that both manual and automatic fire suppression operations can be conducted similtaneously. A set of consistent criteria must be used to measure the water available for fire fighting. The criterion shall be the fire flow available for firefighting water supply measured at a minimum residual pressure of 20 psi. First, residual pressure is the pressure measured when the water supply is flowing versus static pressure, which is measured when the water is not flowing. The criterion of 20 psi residual is used because it is the minimum pressure recommended for fire engine use and provides a consistent point from which to measure the available flow. See additional requirements of IFC Appendix section B below as applied to the needed or available fire flow.

c-1 **(IFC) B103.2 Increases**. The fire code official is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

c-2 **(IFC) B104.1 Fire Area.** The fire area is defined as the floor area, in square feet, used to determine the required fire flow. The fire area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building used to protect storage or use areas, except as modified in Sections B104.2 and B104.3 in Appendix B of the IFC.

c-3 **(IFC) B105.1 One- and two-family dwellings**. The minimum fire flow and duration requirements for one- and two-family dwellings having a fire area which does not exceed 3,600 square feet (344m2) shall be 1,000 gallons per minute (3785 L/min) for two hours. Fire flow and flow duration for dwellings having a fire area in excess of 3,600 square feet (344m2) shall not be less than that specified in Table B105.1 in Appendix B of the IFC. When one- or two family

dwellings exceed 3600 square feet, Table B105.1 of the IFC should be used. A reduction in fire flow by 50 percent may be granted when approved fire sprinklers are installed as approved by the fire code official. A similar exception is allowed for all other types of buildings as approved by the fire code official.

c-4 **(IFC) B105.2 Buildings other than one- and two-family dwellings**. The minimum fire flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1 in Appendix B of the IFC. A reduction in required fire flow of up to 75 percent, as approved by the fire code official, may be allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the SFPC. However, the resulting fire flow shall not be less than 1,500 gallons per minute (5678 L/min.).

d. **(SFPC) 508.4 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 by a third party approved by the fire code official, shall be provided to the fire code official prior to final approval and acceptance of the water supply system by the City. Acceptable available water supply shall be deemed to mean "current flow data" within the past six months of the date of project submittal to include documentation as provided by the City of Chesapeake Department of Utilities. When making requests for water flow data, it shall be the responsibility of the site engineer or fire protection engineer to request current flows as defined here to reflect present water flow conditions to ensure the reliability and functionality of fire protection systems.

e. **(SFPC) 508.5 Fire hydrant systems**. Fire hydrant systems shall comply with Sections 508.5.1 through 508.5.6 of the SFPC. It should be noted that there are two criteria for fire hydrant location that apply. The first pertains to distance from a hydrant to the most remote part of a structure to be protected, which is addressed in SFPC Section 508.5.1 below. The second pertains to the number of hydrants required and the spacing from one hydrant to the next based on the fire flow of a structure(s) located along a fire apparatus access road, which is addressed in Appendix C of the IFC, utilizing table C105.1.

e-1**. (SFPC) 508.5.1 Where required**. Where a portion of the facility or building hereafter constructed is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route capable of supporting firefighting apparatus without obstructions around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official. A fire hydrant shall be required to be located within 50 feet of all FDC's. Firefighters shall not have to hand lay more than 400 feet (122 m) of hose to reach all portions of the exterior grade level of the building. Each hydrant must be accessible to fire apparatus and the 400-foot (122 m) distance should be measured from the hydrant(s) to all portions of the exterior at ground level. This requirement is not intended to prevent the development of rural areas when

municipal fire hydrants are not available as long as the fire code official has approved an alternate water supply in accordance with NFPA 1142. An example of an alternate water supply could be a dry hydrant drawing water supply from a retention pond, storage tanks of sufficient volume, or other such system that is approved by the fire code official.

- Exceptions:
  1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).
  2. For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 of the SFPC, the distance requirement shall be 600 feet (183 m).

e-1.1 **Private Fire Hydrants** - Private fire hydrants must be designed to provide a minimum of 1000 GPM at 20 psi as is required of public fire hydrants, however must meet both the required distance to structures and facilities and the needed fire flow. Private fire hydrants must be maintained, inspected, serviced, and flow tested annually in accordance with NFPA 25 and NFPA 291. See info-link:

Private Fire Hydrant Color Coding – Inspections & Permit Requirements

Private fire hydrants are also required to be identified as such by painting the barrel with Rust-Oleum brand paint or equivalent, #7765 Regal Red (Chesapeake public fire hydrant barrels are painted chrome silver). The bonnets of both public and private fire hydrants shall also be painted the appropriate color in accordance with NFPA 291 representing gpm flow as determined by the listed flow testing requirements. The specific bonnet colors, distinguishing gpm flow, shall be Rust-Oleum brand paint or equivalent as follows:

Class C	Less than 500 GPM	**# 7765 Regal Red**
Class B	500-999 GPM	**# 7743 Lemon Yellow**
Class A	1000-1499 GPM	**# 7538 Hunter Green**
Class AA	1500 GPM & above	**# 7724 Sail Blue**

e-2. **(SFPC) 508.5.4 Obstruction**. Posts, fences, vehicles, growth, trash, storage and other materials or objects shall not be placed or kept near fire hydrants, fire department inlet connections or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants. Nothing is to be placed near a fire hydrant, fire department connection, or control valve that would prevent responding firefighters from immediately recognizing the device.

e-3**. (SFPC) 508.5.5 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. Care must be taken to prevent fences, utility poles, barricades and other obstructions from preventing the operation of fire

hydrants. The centerline of the hose connection(s) shall not be less than 18 inches or more than 36 inches high measured from grade in accordance with NFPA 24.

e-4. **(SFPC) 508.5.6 Physical protection**. Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall comply with Section 312 of the SFPC as listed below. Hose connection threads shall be protected by listed caps provided with a chain attaching the cap(s) to the hydrant to prevent loss.

e-4.1 **(SFPC) 312.2 Posts**. Guard posts (bollards) shall comply with **all** of the following requirements:

- Constructed of steel not less than 4 inches (102 mm) in diameter and concrete filled.
- Spaced not more than 4 feet (1219 mm) between posts on center.
- Set not less than 3 feet (914 mm) deep in a concrete footing of not less than a 15-inch (381 mm) diameter.
- Set with the top of the posts not less than 3 feet (914 mm) above ground.
- Located not less than 3 feet (914 mm) from the protected object.

e-4.2 **(SFPC) 312.3 Other barriers**. Physical barriers shall be a minimum of 36 inches (914 mm) in height and shall resist a force of 12,000 pounds (53 375 N) applied 36 inches (914 mm) above the adjacent ground surface.

C. FIRE PROTECTION SYSTEMS

1. SFPC Section 901 – General

a. **(SFPC) 901.2 Construction documents**. The building and fire code officials shall require construction documents and calculations for all fire protection and hazardous materials dispensing or storage systems (hazmat system) and to require permits be issued prior to the installation, rehabilitation or modification of any fire protection system, including all fire main piping from the private side of the water meter for water suppression systems, or for any hazmat system. Three (3) sets of plans shall be submitted to Fire Prevention by a properly licensed contractor (holding current licenses in VA and Chesapeake) for review and approval that shall include pertinent calculations, manufacturer "cut sheets", drawings and a completed Fire Permit Application. Completed review packages shall be submitted directly to: Fire Prevention at 304 Albemarle Drive, Chesapeake, VA 23322, tel. 757-382-6566, fax. 757-382-8313.

Plan Review Time Table:

New fire alarm or sprinkler system	20 working days
Alteration or addition to any existing system or any other new system	10 working days

A letter of approval is issued by Fire Prevention to accompany approved plans and the Fire permit application signed by the Fire Code Official, which are necessary to obtain a permit from the Department of Neighborhood Services where permit fees are also collected. Upon completion of the system installation and with 2 business days advanced notification to the Fire Prevention Inspection Request Line at 757-382-8211, system inspection and testing will be conducted by a Fire Inspector for final system acceptance approval.

a-1. **(SFPC) 901.2.1 Statement of compliance**. Before receiving final approval of the fire protection system or hazmat system installation, the installing contractor shall furnish a written statement to the fire code official that the subject fire protection system has been installed in accordance with approved plans and has been tested in accordance with the manufacturer's specifications and the appropriate installation standard. Any deviations from the design standards shall be noted and copies of the approvals for such deviations shall be attached to the written statement.

b. **(SFPC) 901.4 Installation**. Required fire protection systems shall be extended, altered, or augmented as necessary to maintain and continue protection whenever a building is altered, remodeled or added to. Alterations to fire protection systems shall be done in accordance with applicable standards.

b-1. **(SFPC) 901.4.1 Required fire protection or hazmat systems**. Fire protection or hazmat systems required by the SFPC or USBC shall be installed and tested accordance with these codes.

b-2. **(SFPC) 901.4.2 Non-required fire protection systems**. Any fire protection system or portion thereof not required by the SFPC or USBC shall be permitted to be furnished for partial or complete protection provided such installed system meets the requirements of these codes.

c. **(SFPC) 901.5 Installation acceptance testing**. Fire detection and alarm systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service main and all other fire protection systems and appurtenances thereto, and hazmat systems shall be subject to acceptance tests as contained in the installation standards and as approved by the fire code official. The fire code official shall be notified before any required acceptance testing.

c-1 Before any acceptance test will be witnessed, approved or accepted by the fire code official the installing contractor must furnish all applicable test certificates as follows:

c-1.1 Sprinkler or Standpipe Systems - A "Contractors Material and Test Certificate for Underground Piping" as contained in NFPA 13 or NFPA 14, as applicable, is required before acceptance testing is conducted or approved for any fire-extinguishing and/or standpipe system. This underground certificate must

include all fire main piping from the private side of the water meter and include all fire main piping located on the premises.

c-1.2 Sprinkler or Standpipe Systems - A "Contractors Material and Test Certificate for Aboveground Piping" as contained in NFPA 13 or NFPA 14, as applicable, is required before acceptance testing is conducted or approved for any fire-extinguishing and/or standpipe system.

c-1.3 Fire Alarm and Fire Detection Systems – "A Record of Completion" and "Certification of Owner/Operator Training in System Operation" as contained in NFPA 72 are required before acceptance testing is conducted or approved for any fire alarm or fire detection system.

c-1.4 Private fire hydrants require a private contractor certification of functionality and compliance with minimum required 1000 gpm flow.

c-2. **(SFPC) 901.5.1 Occupancy**. It shall be unlawful to occupy any portion of a building or structure until the required fire detection, alarm and suppression systems have been tested and approved. Partial occupancy of any structure shall not be permitted until all of the fire protection systems for the areas to be occupied have been tested and approved by the fire code official. All partial occupancy conditions are subject to the final approval of the building code official.

2. **SFPC Section 903 – Automatic Sprinkler Systems**

a. **(SFPC) 903.1 General**. All automatic sprinkler systems shall comply with section 903 of the SFPC. The need for an automatic sprinkler system depends on the occupancy, occupant load, fuel load, height and area of the building as well as firefighting capabilities. Section 903.2 addresses all occupancy conditions requiring an automatic sprinkler system. Section 903.3 contains the installation requirements for all sprinkler systems in addition to the requirements listed in NFPA 13, NFPA 13R and NFPA 13D. Section 903.4 also contains the supervision and alarm requirements for sprinkler systems, and Section 903.5 refers to testing and maintenance requirements for sprinkler systems. The area values contained in section 903 apply to fire areas, which consist of all floor areas within the fire barriers, fire walls, or exterior walls. The only acceptable method to subdivide a building into smaller areas in lieu of installing automatic fire sprinklers is to utilize either fire barriers, fire walls or exterior walls. Such fire barriers, fire walls, or exterior walls must be indicated on the site plan submittal to satisfy a non-requirement for a sprinkler system based on reduced fire area below the square footage threshold.

a-1**. (SFPC) 903.1.1 Alternative Protection**. Alternative automatic fire extinguishing systems complying with Section 904 shall be permitted in lieu of

automatic sprinkler protection where recognized by the applicable standard and approved by the code official (see SFPC Section 904)

a-2. **(SFPC) 903.1.2 Residential Systems**. Unless specifically allowed by this code or the USBC, residential sprinkler systems installed in accordance with NFPA 13D or NFPA 13R shall not be recognized for the purposes of exceptions or reductions permitted by other requirements of this code.

b. **(SFPC) 903.2 Where required**. Approved automatic sprinkler systems and required monitoring systems in new buildings and structures shall be provided in the locations described in section 903.2 of the SFPC. Where a sprinkler system is required the following shall apply:
   1) PIV, FDC and fire hydrant serving the FDC are all required and shall be located on the street side of the structure, and must be located a minimum of 40 feet off the structure.
      - **Exception:** Limited area systems with 20 or fewer sprinkler heads do not require these appurtenances provided hydraulic design calculations are met by available water supply and approved by the fire code official.
   2) Fire hydrant to be located within 50 feet of the FDC to augment sprinkler syst.
   3) PIV to be locked in open position and be monitored for tamper in accordance with SFPC Section 903.4.
   4) FDC shall not be controlled by PIV or any other valves in accordance with NFPA 24 to allow direct augmentation of the sprinkler system by the fire department pumper.
   5) Both the FDC and the fire hydrant required to augment the sprinkler system through the FDC shall not be located more than 50 feet from a fire apparatus access road.
   6) The sprinkler system shall be monitored for tamper and flow and provide alarms in accordance with SFPC Section 903.4 (see section for exceptions).
   7) Proper sizing of piping serving underground fire mains and appurtenances (FDC) shall be of proper size in accordance with NFPA 24 and 13.
   8) Water demand calculations shall be provided to ensure the minimum water demand of the sprinkler system can be met in conjunction with the fire flow demand for manual fire fighting operations.
   9) To avoid confusion by responding emergency personnel, proper signage is required to identify each FDC as to what system or structure is being supplied, and for any areas containing sprinkler system risers, fire pumps, fire alarms, or other pertinent fire protection equipment. (See SFPC Sections 510 and 912.4 for further details)

c. **(SFPC) 903.3.5 Water supplies**. Water supplies for automatic sprinkler systems shall comply with this section and the standards referenced in Section 903.3.1 and the SFPC. The potable water supply shall be protected against backflow in accordance with the requirements of this section, the Department of Public Utilities and the International Plumbing Code.

c-1. **(SFPC) 903.3.5.1 Domestic services**. Where the domestic service provides the water supply for the automatic sprinkler system, the supply shall be in accordance with section 903 of the SFPC.

d. **(SFPC) 903.3.6 Hose threads**. Fire hose threads used in connection with automatic sprinkler systems shall comply with NFPA 1963 or as otherwise approved, and shall be compatible with fire department hose threads.

e. **(SFPC) 903.3.7 Fire department connections**. The location of fire department connections (FDC) shall be approved by the fire code official. All FDCs shall be remote from the building, located out of the potential building collapse zone and a minimum of 40 feet away from a building. (See Section 912 for further information)

3. SFPC Section 904 – Alternative Automatic Fire Extinguishing Systems

a. **(SFPC) 904.1 General.** Automatic fire-extinguishing systems, other than automatic sprinkler systems, shall be designed, installed, inspected, tested and maintained in accordance with the provisions of this section and the applicable referenced standards.

b. **(SFPC) 904.2 Where required.** Automatic fire-extinguishing systems installed as an alternative to the required automatic sprinkler systems of Section 903 shall be approved by the code official. Automatic fire-extinguishing systems shall not be considered alternatives for the purposes of exceptions or reductions permitted by other requirements of this code. Examples of alternative extinguishing systems are commercial cooking hood and appliance suppression systems, spray paint operations, areas containing costly telecommunication and electronics equipment, and areas where wet sprinkler systems are not available or practicable. These systems are supplied from a self contained source utilizing wet or dry chemical, carbon dioxide, and clean extinguishing agents.

4. SFPC Section 905 – Standpipe Systems

a. **(SFPC) 905.1 General**. Standpipe systems shall be provided in new buildings and structures in accordance with section 905 of the SFPC. Fire hose threads used in connection with standpipe systems shall comply with NFPA 1963 or as otherwise approved and shall be compatible with fire department hose threads. The location of fire department hose connections shall be approved by the fire code official. All FDC's shall be remote from the building, located out of the potential building collapse zone and a minimum of 40 feet away from a building. In buildings used for high-piled combustible storage, fire protection shall be in accordance with Chapter 23 of the SFPC.

b. **(SFPC) 905.2 Installation standards**. Standpipe systems shall be installed in accordance with this section and NFPA 14.

c. **(SFPC) 905.3 Required installations**. Standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.6 of the SFPC and in the locations indicated in Sections 905.4, 905.5 and 905.6 of the SFPC. Standpipe systems are permitted to be combined with automatic sprinkler systems.

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

5. SFPC SECTION 907 - FIRE ALARM AND DETECTION SYSTEMS

a. **(SFPC) 907.1 General.** This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.3 are applicable to existing buildings and structures. Although this section and requirements are not generally thought of as a site related requirement, they are included in the Fire Department site plan review so that there is early notification of project requirements. The requirement can be acknowledged by a note on the site plan, or by other official correspondence. See summary table 907.2 in the SFPC.

6. SFPC Section 912 – Fire Department Connections (FDC's)

a. **(SFPC) 912.1 Installation**. Fire department connections (FDC) shall be installed in accordance with the NFPA standard applicable to the system design. The FDC functions to augment the sprinkler system directly by fire department pumper water supply, and should never be configured with any shut off valves such as a PIV. The FDC should contain a one way check valve to ensure flow only in the direction of the fire suppression or standpipe system, and should contain a drip valve to prevent freezing.

b. **(SFPC) 912.2 Location**. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire code official. Fire department connections shall be located remotely off any structure a minimum of 40 feet to be out of the potential hazard area. Hose connection threads shall be protected by listed caps provided with a chain attaching the cap(s) to the FDC to prevent loss.

b-1. **(SFPC) 912.2.1 Visible location**. Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire code official.

c. **(SFPC) 912.3 Access**. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or

any other object for a minimum of 3 feet (914 mm). Landscaping design shall not block an unobstructed view of, or immediate access by firefighters. The centerline of the hose connection(s) shall not be less than 18 inches or more than 48 inches high measured from grade in accordance with NFPA 24.

d. **(SFPC) 912.4 Signs**. A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections serving fire sprinklers, standpipe systems or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION, or a combination thereof as applicable. Signs shall also be provided that identify the type of system and/or zone or particular building served by a given fire department connection.

e. **(SFPC) [P] 912.5 Backflow protection**. The potable water supply to automatic sprinkler and standpipe systems shall be protected against backflow as required by the International Plumbing Code.

f. **(SFPC) 912.6 Inspection, testing and maintenance**. All fire department connections shall be installed in accordance with NFPA 24, and periodically inspected, tested and maintained in accordance with NFPA 25. Connections must be unobstructed, well protected and in good working order. All plugs, covers and caps must be in place and must be easily removed to permit connection of fire hose by firefighters. Exposed piping, fittings, valves and couplings must be free of water where subject to freezing.

7. SFPC Section 913 – Fire Pumps

a. **(SFPC) 913.1 General**. Where provided or required, fire pumps shall be installed in accordance with section 913 of the SFPC and NFPA 20.

b. **(SFPC) 913.2 Protection against interruption of service**. The fire pump, driver, and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

c. **(SFPC) 913.3 Temperature of pump room**. Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

c-1. **(SFPC) 913.3.1 Engine manufacturer's recommendation**. Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

d. **(SFPC) 913.4 Valve supervision**. Where provided, the fire pump suction, discharge and bypass valves, and the isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods.
   1) Central-station, proprietary, or remote-station signaling service.
   2) Local signaling service that will cause the sounding of an audible signal at a constantly attended location.
   3) Locking valves open.
   4) Sealing of valves and approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner.

   d-1. **(SFPC) 913.4.1 Test outlet valve supervision**. Fire pump test outlet valves shall be supervised in the closed position.

e. **(SFPC) 913.5 Testing and maintenance**. Fire pumps shall be installed and tested in accordance with the requirements of section 913 of the SFPC and NFPA 25.

   e-1. **(SFPC) 913.5.1 Acceptance test**. Acceptance testing shall be done in accordance with the requirements of NFPA 20.

   e-2. **(SFPC) 913.5.2 Generator sets**. Engine generator sets supplying emergency or standby power to fire pump assemblies shall be periodically tested in accordance with NFPA 110.

   e-3. **(SFPC) 913.5.3 Transfer switches**. Automatic transfer switches shall be periodically tested in accordance with NFPA 110.

   e-4. **(SFPC) 913.5.4 Pump room environmental conditions**. Tests of pump room environmental conditions, including heating, ventilation and illumination shall be made to ensure proper manual or automatic operation of the associated equipment.

8. **SFPC Section 509 - Fire Command Center**

a. **SFPC) 509.1 Features**. Where required by other sections of this code and in all buildings classified as high-rise buildings by the USBC, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire code official. The fire command center shall be separated from the remainder of the building by not less than a 1- hour fire-resistance-rated fire barrier. The room shall be a minimum of 96 square feet (9 m2) with a minimum dimension of 8 feet (2438 mm). 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. The fire command center shall comply with NFPA72 and shall contain the following features:

   1) The emergency voice/alarm communication system unit.
   2) The fire department communications system.

3) Fire-detection and alarm system annunciator system.
4) Annunciator visually indicating the location of the elevators and whether they are operational.
5) Status indicators and controls for air-handling systems.
6) The fire-fighter's control panel required by Section 909.16 of the SFPC for smoke control systems installed in the building.
7 Controls for unlocking 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 protection systems, fire-fighting equipment and fire department access.
13 Work table.
14 Generator supervision devices, manual start and transfer features.
15 Public address system, where specifically required by other sections of the SFPC.

D. HAZARDOUS PROCESSES

1. Any special requirements, permits, or needs for additional equipment created due to a hazardous process occurring in or outside of a structure(s) or facility potentially adversely affecting the occupants, responding emergency personnel, or the community. May require further review or action by local, state or federal governmental authorities.

2. A hazardous process may require additional fire protection equipment or control measures deemed necessary by the fire code official to prevent or mitigate a potential incident.

3. Operational Fire Code Permits shall be applicable in accordance with Section 107.0 of the SFPC or any city code or ordinance specific to the proposed hazard or process to be conducted.

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