702 Fire Protection in Building Construction

Chapter 1 Fire Protection In Buildings

1.0 New Buildings, Occupancy Conversions, Mixed Occupancies, Additions, and Repairs.

1.1 New Building Construction.

1.1.1 All buildings hereinafter constructed shall meet all applicable sections of these Regulations including the codes and standards contained within Regulation 701, Annex A as well as all applicable sections of any building code which is in effect within Delaware or any of its political subdivisions.

1.2 Occupancy Conversion.

1.2.1 Any existing occupancy hereinafter converted to another occupancy shall meet the provisions of §1.1 of this Chapter.

1.3 Mixed Occupancies.

1.3.1 Where two or more occupancies occur in the same building or structure, and are so intermingled that separate safeguards are impracticable, means of egress facilities, construction, protection, and other safeguards shall comply with the most restrictive code requirements of the occupancies involved.

1.4 Additions.

1.4.1 All additions connected to existing buildings or structures shall meet the provisions of this Regulation and the Existing Occupancy Chapters of the Life Safety Code, NFPA 101, and National Fire Protection Association Codes and Standards as adopted and/or modified by these Regulations.

Exception No. 1: When The Addition(S) To The Existing Building Create An Aggregate, Gross Floor Area Exceeding 10,000 Sq. Ft., The Requirements Of Regulation 702, Chapter 4 Shall Apply.

Exception No. 2: When The Subclassification(S) Of A Mercantile Or Assembly Occupancy Changes Due To The Addition(S), The New Occupancy Chapter of the Life Safety Code, NFPA 101, shall apply.

Note: This revision eliminates the need for a Two Hour Rated Fire Barrier Wall (Class "C" Fire Barrier) to separate additions from existing buildings. The addition and existing building are both required to meet the Existing Occupancy Chapter of the Life Safety Code. Exception No. 1 restricts the aggregate total of the addition and existing building to 10,000 sq.ft. unless the provisions for providing a sprinkler system are met. Exception No. 2 requires the New Occupancy Chapters when, for example, an addition changes a Class C Assembly to a Class B Assembly.

1.5 Repair of Fire, Explosion or Other Damage.

1.5.1 Whenever a building has been damaged by fire, explosion or other cause and the damaged area is less than 50% of the total area only that section damaged shall meet the provisions of §1.1 of this Chapter.

1.5.2 Whenever a building has been damaged by fire, explosion or other cause and the damaged area is 50% or greater the entire building shall meet the provisions of §1.1 of this Chapter.

2.0 Existing Buildings.

2.1 Determination of Hazard; Correction.

2.1.1 Whenever the State Fire Prevention Commission finds a building to be a hazard so inimicable to the safety of the public so as to require correction, in accordance with 16 **Del.C.** §6603, the applicable existing occupancy sections of the Life Safety Code, NFPA 101, shall be used to provide a reasonable level of safety. In addition the State Fire Marshal may use other Regulations, codes and standards as a guide in achieving a reasonable level of safety.

Chapter 2 Fire Barriers

1.0 Definition.

1.1 A fire barrier is a continuous membrane, either vertical or horizontal, such as a wall or floor assembly, that is designed and constructed with a specified fire resistance rating to limit the spread of fire and which will also restrict the movement of smoke. Fire barriers shall be required to meet all applicable sections of these Regulations.

2.0 Reserved - (Class "A" Fire Barriers).

3.0 Two Hour Rated Fire Wall (Class "B" Fire Barriers)

Note: Two Hour Rated Fire Walls (Class "B" Fire Barriers) are utilized to sub-divide buildings that exceed 10,000 aggregate gross square feet, only where no public or private water distribution is available. See Regulation 702, Chapter 4 of this Regulation.

3.1 A Two Hour Rated Fire Wall may be used to reduce a fire compartment within a building to the area limitations required by Chapter 4 of this Regulation, or any other part of these Regulations.

3.2 Two Hour Rated Fire Walls shall meet the following criteria:

3.2.1 The Fire Wall is to be constructed in accordance with the provisions of the Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls, NFPA 221;

3.2.2 The Fire Wall, is to be of masonry construction and is to have a two hour fire resistance rating;

3.2.3 The Fire Wall is to be a cantilevered/free standing fire wall; or, a tied fire wall; or, a double fire wall;

3.2.4 Continuous through the roof and parapetted a minimum of thirty (30) inches. The parapet height shall measured from the top surface of the roof being protected. Roofs sloped greater than ¼ in. per ft. downward toward the wall shall be provided with a minimum thirty-six inch (36") parapet;

Exception No. 1 to 3.2.4: This wall may terminate at the underside of a noncombustible roof deck.
Exception No. 2 to 3.2.4: Exception #1 may be utilized only one time per building exceeding 10,000 square feet. Any Barrier utilized thereafter shall be parapetted per these Regulations.

3.2.5 Openings, if any, protected with a 1 ½ hour fire rated protective assembly on both sides of the opening.

Note: Exceptions No. 1 and 2 to 3.2.4. These exceptions allow the use of a Class B Barrier without a parapet in buildings up to 20,000 square feet. This type of Class B Barrier can be utilized only one time, and any additional fire barriers shall be parapetted per these Regulations.

4.0 Two Hour Rated Fire Barrier Wall (Class "C" Fire Barrier).

4.1 A Two Hour Rated Fire Barrier Wall (for use in providing "approved" fire barriers in order to segment buildings into individual fire divisions) shall be a two hour fire rated assembly, and shall meet the following criteria:

4.1.1 The Fire Barrier Wall is to be constructed in accordance with the provisions of the Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls, NFPA 221;

4.1.2 The Fire Barrier Wall is to have a two hour fire resistance rating;

4.1.3 The Fire Barrier Wall shall extend from the foundation or floor below to the underside of the roof or floor deck above;

4.1.4 Openings, if any shall be protected with a 1 ½ hour fire rated protective assembly on one side of the opening.

Note: Two Hour Rated Fire Barriers (Class "C" Fire Barriers) are utilized to meet the criteria set forth in Regulation 701, Chapter 2, Definitions, One- and Two-Family Dwellings, Townhouse/Rowhouse, or the occupancy is classified as a Multi-Family Residential or Apartment and is required to meet the specifications for that occupancy.

4.2 The Two-Hour Rated Fire Barrier Wall for use in Duplex, Townhouse, Rowhouse, etc. shall consist of a listed assembly extending from the foundation tight to the underside of the smooth surface of the roof deck. The roof decking, extending four (4) feet to each side of the Two Hour Wall assembly, shall be fire retardant or fire treated lumber or a non combustible material.

5.0 Required Plans.

5.1 Sectional plan views of all required Fire Walls and Fire Barrier Walls, shall be submitted as part of the building plans required by Regulation 701, Chapter 4. The Fire Wall and Fire Barrier Wall design shall be listed by a testing laboratory meeting the requirements of Regulation 701, Chapter 5, and the design number and laboratory name shall be provided with the plan submittal.

Chapter 3 Special Fire Safety Provisions For Physically Handicapped People

1.0 Areas of Refuge.

1.1 Definition. An area of refuge for a floor area is that space which is sufficiently protected from the heat and toxic gases produced by a developing fire in the floor area and which provides a direct access to an exit. An area of refuge is intended to facilitate a safe delay in egress from the story containing the floor area, thus constituting a safe space for the handicapped or otherwise disabled persons to await assistance for their safe evacuation.

1.2 Every mid rise building and high rise building shall incorporate areas of refuge which shall be established and maintained in accordance with this Chapter.

1.3 Every floor area of a mid rise building and high rise building where barrier free access is provided above the first story shall have not less than one area of refuge.

1.4 An area of refuge shall consist of one of the following:

1.4.1 A protected space within the floor area acceptable to the State Fire Marshal that:

1.4.1.1 Is separated from the remainder of the floor area by a fire separation having a fire resistance rating of not less than one hour and a level of smoke control at least equal to that required of an accredited exit;

1.4.1.2 Is served by a fire fighters elevator;

1.4.1.3 Provides an aggregate clear floor space of not less than 30" X 48" per non ambulatory occupant, with a minimum of two such spaces provided; (See ANSI A117.1 1986)

1.4.2 A horizontal exit providing an accessible route from one floor area to another floor area;

1.4.3 A protected space that is either part of an accredited exit or connected by a door to an accredited exit and that:

1.4.3.1 Is separated from the remainder of the floor area by a fire separation having a fire resistance rating and level of smoke control at least equal to that required of the accredited exit;

1.4.3.2 Provides an aggregate floor space of not less than 30" X 48" per non ambulatory occupant, with a minimum of two such spaces provided; (See ANSI A117.1 1986)

1.5 Areas of refuge shall be designated as such on all building plans and identified as such within the building. Identification within the building shall incorporate the "International Symbol of Accessibility" and be tactile in texture in accordance with ANSI Standard A117.1-1986. Except for doors, glazed

openings shall not be permitted in walls separating areas of refuge from the remainder of the floor area.

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2.0 Emergency Communication and Fire Alarm Signaling Systems.

2.1 Maximum Height.

2.1.1 The maximum mounting height for emergency communication and alarm system devices shall not be greater than 54 inches from the highest operation control to the floor.

2.2 Visual Alarms Indicating Appliances.

2.2.1 Where fire alarm signaling systems are required by other sections of these Regulations, both audible and visible alarm indicating appliances shall be installed.

2.2.2 Visible alarm indicating devices shall be of the direct viewing strobe type unless in the opinion of the State Fire Marshal the indirect viewing type are necessary due to the nature of the occupancy.

2.2.3 All visual indicating appliances installed shall be strobe lights listed for the protective signaling purpose for which they are used.

2.2.4 Visual indicating appliances shall be installed in all areas where required by the State Fire Marshal.

3.0 Inclined Wheel Chair Lifts Permitted.

3.1 Location.

3.1.1 A single inclined wheelchair lift may be installed in buildings meeting all of the following criteria:

3.1.1.1 Where permitted, the inclined wheelchair lift may serve only the first two (2) floors above the level of exit discharge and only one (1) floor below the level of exit discharge of any building, and;

3.1.1.2 There are at least two mean of egress from each floor of the building, that are in compliance with the applicable provisions of the State Fire Prevention Regulations, and;

3.1.1.3 The total occupant load may not exceed thirty (30) persons per floor, and;

3.1.1.4 The building to be equipped with the inclined wheelchair lift shall be protected with an automatic smoke detection and fire alarm signaling system in accordance with the National Fire Alarm Code, NFPA 72, and;

3.1.1.5 There shall be an interface of the controls for the inclined wheelchair lift and the fire alarm signaling system to have the wheelchair lift return to the level of exit discharge, and remain there, if the lift happens to be in use when the fire alarm signaling system is activated, and;

3.1.1.6 The inclined wheelchair lift shall be provided with an auxiliary power source to ensure operation of the lift in the event of a loss of building power, and;

3.1.1.7 The inclined wheelchair lift shall be provided with controls that will permit the fire department to control the movement of the lift, and;

3.1.1.8 When not in use the inclined wheelchair lift shall be stored in an upright position or shall be otherwise designed to be stored in a manner that will not obstruct egress in any way.

3.1.2 For each floor of a building to be served with an inclined wheelchair lift, only one of the two required means of egress as specified in §3.1.1.2 of this Chapter, may have an inclined wheelchair lift installed.

4.0 Vertical Platform Lifts Permitted.

4.1 Location.

4.1.1 A single vertical platform lift may be installed in Educational occupancies meeting all of the following criteria:

4.1.1.1 Where permitted, the vertical platform lift shall serve only two (2) floors; the level of exit discharge and either a level above or a level below the level of exit discharge of any building, and;

4.1.1.2 There are at least two mean of egress from each floor of the building, that are in compliance with the applicable provisions of the State Fire Prevention Regulations, and;

4.1.1.3 The building equipped with the vertical platform lift shall be protected with an automatic sprinkler system or an automatic smoke detection and fire alarm signaling system in accordance with the National Fire Alarm Code, NFPA 72, and;

4.1.1.4 Where an automatic smoke detection and fire alarm signaling system is provided, there shall be an interface of the controls for the vertical platform lift and the fire alarm signaling system to have the vertical platform lift return to the level of exit discharge, and remain there, if the lift happens to be in use when the fire alarm signaling system is activated, and;

4.1.1.5 The vertical platform lift shall be provided with an auxiliary power source to ensure operation of the lift in the event of a loss of building power, and;

4.1.1.6 The vertical platform lift shall be provided with controls that will permit the fire department to control the movement of the lift, and;

4.1.1.7 Only one installation shall be permitted in a building.

4.1.2 The installation of the vertical platform shall not interfere, obstruct or otherwise impede egress capacity of any of the required means of egress.

Chapter 4 Automatic Sprinkler Systems and Standpipe Systems

1.0 Automatic Sprinkler Systems.

1.1 Installation Required. Automatic sprinkler systems shall be installed in accordance with the Standard for the Installation of Sprinkler Systems (NFPA 13) in all areas and occupancies as required in the applicable codes and standards as listed in Regulation 70I, Annex A of these Regulations as well as the following:

1.1.1 In all buildings exceeding 10,000 square feet of aggregate, gross floor area.

Exception No. 1: One- and Two-Family dwellings.

Exception No. 2: Where no public or private water distribution system is available, a Class "B" Fire Barrier may be utilized to subdivide a one story building into fire areas of less than 10,000 square feet.

Exception No. 3: Buildings or structures of one story in height where:

1. This Exception does not apply to places of assembly, educational or institutional occupancies.

2. The exterior and interior bearing walls, columns, beams, girders, trusses or arches are constructed of noncombustible material, per the Standard on Types of Building Construction, NFPA 220, as adopted and/or modified by these Regulations; and

3. The construction is noncombustible; and

4. The occupant load is low; and

5. The means of egress components comply with these Regulations and the Life Safety Code, NFPA 101, as adopted and/or modified by these Regulations; and

6. The fuel load is identifiable, permanent, and noncombustible.

Note: Exception No. 3: It is the intent of this exception not to require the installation of automatic sprinklers in buildings or structures in excess of 10,000 square feet when used for the storage of an identifiable, noncombustible fuel load where the number of occupants is low. For example a building used for the storage of concrete block, concrete pipe, steel, etc.

Exception No. 4: Open parking structures, per the Standard for Parking Structures, NFPA 88A, as adopted and/or modified by these Regulations, constructed of noncombustible materials, per the Standard on Types of Building

Construction, NFPA 220, as adopted and/or modified by these Regulations. Under this exception, open parking structures without automatic fire suppression systems shall not be located beneath any other occupancy. Also under this exception, open parking structures without automatic fire suppression systems that are located adjacent to any other occupancy shall be properly separated by a Two Hour Rated Fire Wall in accordance with Chapter 2, §3.0 of this Regulation.

1.1.2 In all buildings in excess of 40 feet in height or more than four (4) stories in height.

1.1.3 In all buildings or areas thereof used for the storage, fabricating, assembling, manufacturing, processing, display or sale of combustible goods, wares, merchandise, products, or materials when more than two (2) stories or 25 feet in height.

1.1.4 In all basement areas exceeding 2,500 square feet floor area.

1.1.5 In residential occupancies when of:

1.1.5.1 Type V (0,0,0) or Type III (2,0,0) construction and exceeding two (2) stories or 25 feet in height.

1.1.5.2 Type V (1,1,1) and Type III (2,1,1) or Type IV (2,H,H) construction exceeding three (3) stories or 35 feet in height.

Note: Above referenced construction classifications are defined under the Standard on Types of Building Construction, NFPA 220.

Exception No. 1: Single family detached dwellings are exempted from this requirement.

Exception No. 2:Attached One- and Two-Family dwellings are exempted from this requirement when dwelling units are separated by two hour rated construction, in accordance with Regulation 701, Chapter 2.

1.1.6 In all residential apartment buildings storage areas except individual unit closets that are located within individual residential living units.

1.1.7 In all buildings used as health care occupancies as defined in the Life Safety Code, NFPA 101, as adopted and/or modified by these Regulations.

1.1.8 In all buildings or areas classified as "high hazard" under the Life Safety Code, NFPA 101, or "extra hazard" under the Standard for the Installation of Sprinkler Systems, NFPA 13, as adopted and/or modified by these Regulations.

1.1.9 All buildings used as dormitories, in whole or in part, to house students at a public or private school or public or private institution of higher education. (16 **Del.C.** Ch. 88) This applies to all such dormitories regardless if new or existing.

1.2 Installation and Plan Review.

1.2.1 All automatic fire suppression systems shall be installed in accordance with the applicable codes and standards as listed in Regulation 701, Annex A.

Exception No. 1: The State Fire Marshal may accept a fire suppression system which does not meet the strict provisions of the applicable codes and standards when in his opinion the proposed system will provide an equivalent level of life safety.

Exception No. 2: Whenever an NFPA 13R system is proposed, the Fire Marshal shall evaluate the effect of NFPA 13R exceptions on the fire safety of the building. When in the opinion of the Fire Marshal an adequate level of fire safety cannot be achieved with the application of the exception, he may disapprove the use of the exception.

1.2.2 Plans of all proposed automatic fire suppression systems shall be submitted to the State Fire Marshal for review and approval in accordance with the provisions of Regulation 701, Chapter 4.

2.0 Standpipes.

2.1 Where Required.

2.1.1 Standpipes shall be provided in all areas and buildings as required in the codes and standards listed in Regulation 701, Annex A as well as the following areas or buildings:

2.1.2 In all Class A and Class B places of assembly and institutional occupancies two (2) stories or 25 feet in height or over.

2.1.3 In any building over three (3) stories..

2.1.4 In any building over 35 feet in height.

2.1.5 In any building that has a floor above the first floor over 10,000 square feet gross floor area.

2.1.6 In all buildings where the 1st floor exceeds 60,000 gross square feet, a Class I horizontal standpipe system installed in accordance with the applicable codes and standards listed in Regulation 701, Annex A of these Regulations shall be provided.

2.2 Installation.

2.2.1 All standpipe systems shall be installed in accordance with the applicable codes and standards listed in Regulation 701, Annex A.

2.2.2 The standpipe system shall be carried up with each floor and shall be installed and ready for use as each floor progresses. Standpipes shall not be more than one floor below the highest forms of staging.

2.3 Floor Level Identification.

2.3.1 A sign shall be provided at each landing, in all interior stairways, designating the floor level.

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Chapter 5 Mid Rise, High Rise and Large Area Buildings

1.0 Mid Rise Building Fire Protection Features Required.

1.1 Fire Command Center

1.1.1 Every Mid Rise building shall contain a fire command center for fire department operations in a location reviewed by the responsible Fire Chief and approved by the Office of the State Fire Marshal.

1.1.2 The fire command center shall contain the following:

1.1.2.1 Fire detection and alarm system annunciator panels and smoke management panels

1.1.2.2 Status indicator for elevator and annunciator indicating which elevators are operational

1.1.2.3 Status indicators and controls for air handling

1.1.2.4 Emergency power, light and system controls; and status indicators

1.1.2.5 Telephone and internet access for fire department use

1.1.2.6 Emergency and standby power status indicators

1.1.2.7 Generator supervision devices and manual start and transfer features

1.1.2.8 Controls for unlocking fire exit stairway doors simultaneously

1.1.2.9 Controls required for smoke control

1.1.2.10 Important Keys to include

1.1.2.10.1 Elevator machine room

1.1.2.10.2 Elevator hoistway door access key

1.1.2.10.3 Side access door elevator car key

1.1.2.10.4 Electric room keys

1.1.2.10.5 Fire pump room keys

1.1.2.10.6 Mechanical room keys

1.1.2.10.7 Any master key

1.1.2.11 As built drawings. Specific types and format of drawings to be determined by the Office of the State Fire Marshal at time of plan review.

1.1.3 The Office of the State Fire Marshal may reduce the requirements of §1.1.2 of this Chapter if the Office of the State Fire Marshal determines that a specific item is not necessary for a specific building.

1.1.4 It is not the intent of this section to require a room solely for the purpose of a fire command center. The fire command center can be constructed as part of a lobby, security office, or other accessible gathering area. However, this area must meet the minimum criteria specified in this section for equipment, location, and personnel use.

1.2 Fire Alarm and Detection

1.2.1 Every Mid Rise building shall be provided with a fire alarm and detection system in accordance with the Life Safety Code, (NFPA 101) and other provisions of the Delaware State Fire Prevention Regulations.

1.2.2 Every Mid Rise building shall be provided with a standard manual fire alarm system with audio and visual devices in accordance with the National Fire Alarm Code (NFPA 72).

1.3 Smoke Management

1.3.1 Every Mid Rise building shall have fire exit stair tower pressurization in accordance with NFPA 92A and include Areas of Refuge if located in an enclosed area other than an exit stair tower.

1.3.2 Except for the lobby at main entrance level, all elevators lobbies shall be separated from the remainder of the floor by a smoke barrier. The elevator lobby is permitted to serve additional elevators.

1.3.3 The elevator lobbies shall be permitted to be open to the remainder of the floor in buildings equipped with a mechanical smoke control system that will restrict smoke and hot gases from entering the elevator shaft on the fire floor.

1.4 Standby Power, Light, and Emergency Systems

1.4.1 Every Mid Rise building shall be provided with an emergency power supply.

1.4.2 Standby power, light and emergency systems shall comply with the provisions of NFPA 110, or NFPA 111 as adopted and modified by these Regulations.

1.4.3 The fuel supply located on premises shall be sufficient for not less than two hours of the full demand operation of the system.

1.4.4 The standby system shall have a rated capability needed to simultaneously supply all equipment required to be operational during an emergency.

1.4.5 All required lighting, smoke management pressurization, electrically powered fire pumps and at least one elevator shall be connected to the standby power source. Elevators shall be provided with a selective load switch to allow transfer of power to each elevator. This will permit each elevator to be returned to the lobby and placed out of service except for fire department service.

1.4.6 Emergency Systems. Exit signs, exit illumination, and elevator car lighting shall be considered emergency systems, shall be connected to the standby source and shall operate within ten seconds of failure of the normal power supply.

1.4.7 Areas of Refuge. Areas of Refuge shall be provided in accordance with the requirements of this Regulation, Chapter 3.

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2.0 High Rise Building Fire Protection Features Required.

2.1 Fire Command Center

2.1.1 Every High Rise building shall contain a fire command center for fire department operations in a location reviewed by the responsible Fire Chief and approved by the Office of the State Fire Marshal.

2.1.2 The fire command center shall contain the following:

2.1.2.1 Voice alarm and public address panels

2.1.2.2 Fire department communications panel

2.1.2.3 Fire detection and alarm system annunciator panels and smoke management panels

2.1.2.4 Status indicator for elevator and annunciator indicating which elevators are operational

2.1.2.5 Status indicators and controls for air handling systems

2.1.2.6 Controls for unlocking all fire exit stairway doors simultaneously

2.1.2.7 Emergency power, light and system controls; and status indicators

2.1.2.8 Telephone and internet access for fire department use

2.1.2.9 Emergency and standby power status indicators

2.1.2.10 Generator supervision devices and manual start and transfer features

2.1.2.11 Public address system, where specifically required by other sections of this Code

2.1.2.12 Controls required for smoke control

2.1.2.13 Important Keys to include

2.1.2.13.1 Elevator machine room

2.1.2.13.2 Elevator hoistway door access key

2.1.2.13.3 Side access door elevator car key

2.1.2.13.4 Electric room keys

2.1.2.13.5 Fire pump room keys

2.1.2.13.6 Mechanical room keys

2.1.2.13.7 Any master key

2.1.2.14 As built drawings. Specific types and format of drawings to be determined by the Office of the State Fire Marshal at time of plan review.

2.1.3 The fire command center shall be separated from the remainder of the building by one-hour construction and equipped with a heating, ventilating and air conditioning system that will prevent smoke laden air from entering the space.

2.1.4 It is not the intent of this section to require a room dedicated for this purpose, but the area provided must be available for immediate use in case of emergency.

2.1.5 The room shall be a minimum of 96 square feet with a minimum dimension of 8 feet.

2.1.6 The fire command room door shall be clearly identified for use by the fire department.

2.2 Emergency Voice/Alarm Communications and Detection System

2.2.1 Every High Rise building shall be equipped with a voice alarm, communication and detection system which shall be installed in accordance with the applicable codes and standards listed in Regulation 701, Annex A of these Regulations; and approved by the Office of the State Fire Marshal.

2.3 Public Address System

2.3.1 A public address communication system shall be part of the Emergency Voice/Alarm Communications System as required in §2.2 of this Chapter. The system shall be designed to be clearly heard by all occupants of the building and shall operate from the fire command center. It shall be established on a selective or general basis to the following terminal areas:

2.3.1.1 Elevators

2.3.1.2 Elevator lobbies

2.3.1.3 Corridors

2.3.1.4 Exit stairways

2.3.1.5 Rooms and tenant spaces exceeding 1,000 square feet in area

2.3.1.6 Dwelling units and guest rooms or suites.

2.4 Fire Department Communication System

2.4.1 A two way fire department communication system in accordance with the *National Fire Alarm Code* (NFPA 72) shall be provided for fire department use.

2.4.2 An alternative fire department radio enhancement system installed within the building shall be permitted in lieu of a two way fire department communications system, when approved by the Office of the State Fire Marshal.

2.5 Door Operation

2.5.1 All fire exit stairway doors which are to be locked from the stairway side shall have the capability of being unlocked simultaneously without unlatching upon a signal from the Fire Command Center.

2.6 Elevators

2.6.1 In every High Rise building at least one elevator service shall be provided for fire department emergency access to all floors.

2.6.2 Except for the main entrance level, all elevators shall open into a lobby (which may serve additional elevators) separated from the remainder of the building by a smoke barrier. Janitor closets, chutes, guest or tenant rooms, and service rooms shall not open into the elevator lobby. In addition, the provisions of ANSI Standard A 17.1 shall apply.

2.6.3 The elevator lobbies shall be permitted to be open to the remainder of the floor in buildings equipped with a mechanical smoke control system that will restrict smoke and hot gases from entering the elevator shaft on the fire floor.

2.7 Smoke Management Systems

2.7.1 In every High Rise building a Smoke Management system shall be installed in accordance with NFPA 92A, 92B and approved by the Office of the State Fire Marshal. Such system shall provide the following:

2.7.1.1 Egress Stair Tower Pressurization

2.7.1.2 Area of Refuge Pressurization

2.7.1.3 Horizontal Exit Passageway Pressurization

2.7.1.4 Fire Floor Smoke Exhaust

2.7.1.5 Floor Above and Below Fire Floor Pressurization

2.7.1.6 Other criteria as deemed necessary by the Office of the State Fire Marshal for Unusual Spaces.

2.7.2 Smoke management system operation/actuation shall be approved by the Office of the State Fire Marshal.

Note: As per NFPA 92A and 92B, the smoke management system shall be provided with a graphic annunciator and manual override panel to be located in the Fire Command Center. The design and operation of the graphic annunciator shall be proposed by the designer and approved by the Office of the State Fire Marshal.

2.8 Standby Power, Light, And Emergency Systems

2.8.1 In every High Rise building an emergency power supply shall be installed.

2.8.2 Standby power, light and emergency systems shall comply with the provisions of the Standard for Emergency and Standby Power Systems, NFPA 110, as adopted and/or modified by these Regulations.

2.8.3 Fuel Supply. An on premises fuel supply sufficient for not less than two hours full demand operation of the system shall be provided.

2.8.4 Generating Capacity. The standby system shall have a capacity and rating that will supply all equipment required to be operational at the same time. The generating capacity need not be sized to operate all the connected electrical equipment simultaneously.

2.8.5 All power, lighting, signal, and communication systems required by this Regulation shall automatically transfer to a standby source. The standby power system shall be connected to all systems listed in the NFPA *101 Life Safety Code*.

2.9 Emergency Systems

2.9.1 Exit signs, exit illumination, and elevator car lighting are classified as emergency systems and shall operate within ten seconds of failure of the normal power supply and must also be connected to the standby source.

2.9.2 All required lighting, smoke management pressurization, electrically powered fire pumps and at least one elevator shall be connected to the standby power source. Elevators shall be provided with a selective load switch to allow transfer of power to each elevator. This will permit each elevator to be returned to the lobby and placed out of service except for fire department service.

2.10 Areas of Refuge. Areas of Refuge shall be provided in accordance with the requirements of Regulation 702, Chapter 3.

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3.0 Large Area Buildings.

3.1 Application. The application of this Chapter pertains to any building exceeding one-hundred thousand (100,000) square feet gross floor area on any one floor. This Chapter does not apply to Strip Shopping/Office Center with no individual tenant exceeding 100,000 sq. ft.

3.1.1 If any one individual tenant in a Strip Shopping/Office Center exceeds 100,000 sq. ft. per floor, these requirements shall apply only to those tenants.

3.2 Horizontal Standpipes.

3.2.1 Horizontal Standpipes shall be required in accordance with Regulation 702, Chapter 4 of these Regulations

3.3 Emergency Voice/Alarm Communications and Detection System.

3.3.1 Large area buildings shall be equipped with a voice alarm, communication and detection system which shall be installed in accordance with the applicable codes and standards listed in Regulation 701, Annex A of these Regulations; and approved by the Office of the State Fire Marshal

3.4 Fire Command Station.

3.4.1 Large area buildings containing Health Care Occupancies, Ambulatory Health Care and Detention and Correction Occupancies shall contain a fire command center for fire department operations in a location reviewed by the responsible Fire Chief and approved by the Office of the State Fire Marshal. The Office of the State Fire Marshal may require a Fire Command Center for other Large Area Buildings.

3.4.2 The fire command center shall contain the following:

3.4.2.1 Voice alarm and public address panels

3.4.2.2 Fire department communications panel

3.4.2.3 Fire detection and alarm system annunciator panels and smoke management panels

3.4.2.4 Status indicator for elevator and annunciator indicating which elevators are operational

3.4.2.5 Status indicators and controls for air handling systems

3.4.2.6 Controls for unlocking all fire exit stairway doors simultaneously

3.4.2.7 Emergency power, light and system controls; and status indicators

3.4.2.8 Telephone and internet access for fire department use

3.4.2.9 Emergency and standby power status indicators

3.4.2.10 Generator supervision devices and manual start and transfer features

3.4.2.11 Public address system, where specifically required by other sections of this Code

3.4.2.12 Controls required for smoke control

3.4.2.13 Important keys to include

3.4.2.13.1 Elevator machine room

3.4.2.13.2 Elevator hoistway door access key

3.4.2.13.3 Side access door elevator car key

3.4.2.13.4 Electric room keys

3.4.2.13.5 Fire pump room keys

3.4.2.13.6 Mechanical room keys

3.4.2.13.7 Any master key

3.4.2.14 As built drawings. Specific types and format of drawings to be determined by the Office of the State Fire Marshal at time of plan review.

3.4.3 The fire command center shall be separated from the remainder of the building by one-hour construction and equipped with a heating, ventilating and air conditioning system that will prevent smoke laden air from entering the space.

3.4.4 It is not the intent of this section to require a room dedicated for this purpose, but the area provided must be available for immediate use in case of emergency.

3.4.5 The room shall be a minimum of 96 square feet with a minimum dimension of 8 feet.

3.4.6 The fire command room door shall be clearly identified for use by the fire department.

3.5 Smoke Management Systems

3.5.1 Large area buildings shall be equipped with a smoke management system approved by the Office of the State Fire Marshal, designed in accordance with §3.5.2 or §3.5.3, and shall be capable of being operated by the fire department.

3.5.2 This smoke control system shall, at a minimum, consist of manually operated smoke vents installed in accordance with the Standard for Smoke and Heat Venting, NFPA 204 with the following criteria:

3.5.2.1 One, 100 sq. ft. vent per 25,000 sq. ft. of floor area.

3.5.2.2 Each vent shall be centrally located within the 25,000 sq. ft. protected area.

3.5.3 Large Area buildings using mechanical means of smoke management shall be installed in accordance with NFPA 92A, NFPA 92B and approved by the Office of the State Fire Marshal. Such system shall provide the following:

3.5.3.1 Egress Stair Tower Pressurization if stairs are more than three (3) communicating floor levels

3.5.3.2 Area of Refuge Pressurization

3.5.3.3 Horizontal Exit Passageway Pressurization

3.5.3.4 Fire Floor or Fire Area Smoke Exhaust

3.5.3.5 Other Criteria as deemed necessary by the Office of the State Fire Marshal for Unusual Spaces

3.5.4 Smoke management system operation/actuation shall be approved by the Office of the State Fire Marshal.

Note: As per NFPA 92A and NFPA 92B, the smoke management system shall be provided with a graphic annunciator and manual override panel to be located in the fire command center. The design and operation of the graphic annunciator shall be approved by the Office of the State Fire Marshal.

3.6 Standby Power, Light, and Emergency Systems.

3.6.1 Large area buildings shall be equipped with standby power, light, smoke management system and emergency systems which shall comply with the provisions of the Standard for Emergency and Standby Power Systems, NFPA 110, as adopted and/or modified by these Regulations.

Exception: If the occupancy is such that "standard" battery operated emergency systems (emergency lighting, exit signs, fire alarm signaling system backup power, etc.), are deemed to be adequate by the State Fire Marshal.

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Chapter 6 Standard for Fire Flow for Fire Protection

1.0 General.

1.1 Purpose. The purpose of this Chapter is to specify minimum requirements for water supplies for fire protection and fire fighting services (fire flow) that will provide a reasonable degree of protection to life and property from fire.

1.2 Intent. It is the intent of this Chapter that the State Fire Marshal, the fire department having jurisdiction, the land developers in the jurisdiction, and any other responsible agencies shall work together to provide and maintain the minimum fire flow requirements contained herein.

1.3 Scope. This Chapter establishes minimum requirements for water supplies for fire protection and fire fighting purposes. This Chapter also sets the requirements in rural areas where there is no public, private or central water system available from water companies. The requirements are performance oriented and allow the owner or developer the option of choosing the method of attaining the water supply required with consideration given to local conditions.

1.4 This Regulation does not apply to:

1.4.1 Residential sub-divisions, located with the jurisdiction of New Castle County, containing more than twenty-five (25) lots, or minimum aggregate side yard widths of less than thirty (30) feet. These requirements are contained in New Castle County Code Chapter 40, Article 12.

Note: New Castle County Code Chapter 40, Article 12, Sewer and Water Impact:

SECTION 40.12.210 WATER SERVICE

Each water supply company shall develop a method to determine water volumes and pressure in their systems. On-site testing shall be used as the basis for determining the capacities in lines, pumps, storage and distribution facilities. The certification of adequate capacity of the water service shall be obtained by the developer from the water supplier.

SECTION 40.12.115 WATER SUPPLY

A. All proposed residential subdivisions containing more than twenty-five (25) lots or minimum aggregate side yard widths of less than thirty (30) feet shall provide a public or community water distribution system. The design and installation of such public or community system shall be subject to the approval of the appropriate State agencies, and the main sizes shall meet the requirements of the Office of the State Fire Marshal.

B. Where the subdivider proposes that individual on-site water supply systems be utilized within the subdivision, the subdivider shall either install such facilities or shall require, by deed restriction or otherwise, as a condition of the sale of each lot or parcel within the subdivision, that the facilities shall be installed by the purchaser of such lot or parcel at the time that a principal building is constructed thereon, in accordance with appropriate State requirements. Where individual on-site water supply systems are to be utilized, each lot shall be of a size and shape to allow safe location of such a system. An on-site water supply shall further require a permit from appropriate State agencies.

1.4.2 Fire hydrants, located within the jurisdiction of New Castle County. These requirements are contained in New Castle County Code, Chapter 40, Article 22.

Note: New Castle County Code Chapter 40 Article 22, Drainage, Utilities, Septic Systems, Parking, Loading, and Lighting:

SECTION 40.22.430 FIRE HYDRANTS AND FIRE LANES.

A. Fire hydrants in subdivisions shall be installed within five hundred (500) feet of all houses, measured by way of accessible public thoroughfare, wherever a public or community water supply system is provided, as required by the National Association of Fire Underwriters, and within four hundred (400) feet of all commercial and industrial establishments, as approved by the State Fire Marshal.

B. All fire hydrants shall be shown on record plans, with an indication of water main sizing connecting thereto.

C. The need for and location of fire lanes for multi-family and row or group residential, commercial, industrial and institutional development will be determined by the State Fire Marshal in accordance with the guidelines contained in the publication Standard for Compliance with New Castle County published by the State Fire Marshal. In applying such guidelines, a fire lane shall be deemed necessary only where reasonable and direct accessibility by fire apparatus cannot be made to at least one (1) side of a structure from an all-weather hard surface, capable of bearing the weight of commonly used fire apparatus. Such fire lanes to be provided need not be paved with concrete, amesite or similar material, but may be surfaced in any suitable manner such as to provide an all-weather surface capable of performing the function and shall be signed in such a fashion as to indicate the purpose and intent thereof and to prohibit parking thereon.

D. Where equivalent fire protection is provided by appropriately sized standpipes or similar arrangements, the requirements of subsection C of this Section shall not be applicable.

2.0 Application.

2.1 Notwithstanding, any other provisions of the Delaware State Fire Prevention Regulations, for all buildings or structures of less than 10,000 square feet of aggregate gross floor area, and where there is not a public water system or a central water system; the State Fire Marshal may utilize the provisions of the Standard on Water Supplies for Suburban and Rural Fire Fighting, NFPA 1142, as adopted and/ or modified by these Regulations, as meeting the requirement for fire flow. (See §7.0, Dry Hydrants, at the end of this Chapter).

2.2 A building, structure or the use of a parcel of land shall not be constructed, extended, renovated, or altered in violation of this Chapter. All provisions of this Chapter shall be met prior to the existence of the exposure or hazard unless arrangements can be made to phase the installation of the fire protection, which is acceptable to the State Fire Marshal, and would not impair the intent of this Chapter.

2.3 This Chapter applies wherein the construction, renovation, or alteration constitutes a hazard or condition which could create a self-propagating fire exposing an existing structure, fuel load, or property line that could be built upon. In the event there is no existing adjacent structure, the location of the property line shall govern.

2.4 This Chapter applies to all occupancies including one- and two-family dwellings, any hazardous processes, and the handling, storing, or use of flammable and combustible liquids and flammable gases.

Note: Any flammable and combustible liquid and gas site that falls within the scope of a specific NFPA code, as adopted and/or modified by these Regulations, shall be subject to additional requirements, for water supplies, including, but not limited to, the following:

NFPA 30, Flammable and Combustible Liquids Code
NFPA 30A, Automotive and Marine Service Station Code
NFPA 31, Standard for the Installation of Oil Burning Equipment
NFPA 54, National Fuel Gas Code
NFPA 58, Storage and Handling of Liquefied Petroleum Gases

Any occupancy that falls within the scope of a specific NFPA code, as adopted and/or modified by these Regulations, shall be subject to additional requirements for water supplies, including, but not limited to, the following:

NFPA 45, Standard on Fire Protection for Laboratories using Chemicals
NFPA 88A, Standard for Parking Structures
NFPA 88B, Standard for Repair Garages

Exception: This Chapter does not apply to four (4) or less one- and two-family dwellings when the four (4) one- and two-family dwellings, considered as a group or one fuel station, do not create an exposure to any other structure, fuel station or property line that could be built upon.

Note: Exception: It is the intent of this exception not to require water distribution systems when four or less single family detached dwellings are constructed in close proximity to each other (less than 100 feet). It is not the intent of this exception to allow or condone the construction of multiple groups of four (4) or less single family detached dwelling units wherein the arrangement of those groups constitutes a configuration that, in the opinion of the State Fire Marshal, would support a self propagating fire from one fuel station to the next.

2.5 The owner or his representative shall submit adequate plans of any construction, renovation, alteration or the use of a parcel of land prior to any work being performed and obtain written approval from the State Fire Marshal. The plans shall display all necessary information and calculations in accordance with this Regulation. At the completion of construction and prior to occupancy or functional use, the owner or his representative shall supply to the State Fire Marshal a report verifying the following:

2.5.1 That the actual exposure distances on the site as constructed are within the allowable limits of this Regulation and the approved plans;

2.5.2 That the required fire flow was obtained and verified by on site flow testing, at the required minimum residual pressure;

2.5.3 That the hydrant spacing, location and arrangement is in accordance with this Regulation and the plan approval, and;

2.5.4 That the required minimum duration of flow, as required by this Regulation and the plan approval, is obtainable as verified by field calculations of the storage facilities.

Exception to §2.5.4: When an unproven well (new well or a well that has been out of service for more than six months) is used as a water supply source, the owner may meet the requirements by one of the following methods:

1. Obtain certification from a recognized authority that the well is capable of providing the minimum required fire flow for the minimum required duration.

OR

2. Provide flow test results verifying that the unproven well was tested and provided the required minimum fire flow for the required minimum duration.

3.0 Required Fire Flows.

3.1 Fire Flow Tables.

3.1.1 Required fire flows are to be determined from the Fire Flow Tables 1 and 2 based on exposure hazard, building areas, and the occupancy use of the structure(s) being considered. The Fire Flow Tables specify required minimum hydrant spacing and required fire flow and duration.

3.1.2 Where existing public, private, or central water systems including municipalities, cannot meet the fire flow requirements specified in Fire Flow Table 2, the provisions of Fire Flow Table 1 shall apply.

Exception: The requirements of Fire Flow Table 3 may be applied to areas where there is a public, private, or central water system, but the requirements of Fire Flow Table 2 cannot be met. The setbacks may be reduced proportionally based on the amount of water available. This exception does not apply to new public, private, or central water systems, including municipalities, nor does it apply to expansions to existing public, private, or central water systems, including municipalities.

3.1.3 All areas are aggregate gross square footage as shown in the Fire Flow Tables. In all unusual structures and mixed occupancies not shown in the Fire Flow Tables, the State Fire Marshal shall determine required flows, hydrant spacing, duration, and available capacity.

3.1.4 Where a fire alarm signaling system is required by Fire Flow Table 1, this system shall be automatic, supervised off-site, and shall consist of full coverage by smoke detection and alarm notification. Where smoke detection devices will not function by reason of device limitation, heat detection shall be provided in those specific locations. Fire alarm signaling system plans and specifications shall be submitted for review, in accordance with Regulation 701, Chapter 4.

Exception: Where the building is protected throughout by an automatic sprinkler system.

3.2 Modification for Sprinkler System Installations.

3.2.1 Where the structure being considered is protected throughout by an automatic sprinkler system, the required fire flow shall be modified to meet the designed sprinkler demand where hydraulically calculated plus outside hose streams as specified in the applicable NFPA Codes and Standards as adopted and/or modified by these Regulations.

Exception: Hose stream allowance may be eliminated by the State Fire Marshal where there is no public nor private water system supplying the automatic sprinklers.

3.2.2 Where a pipe schedule system is installed, the fire flow shall be modified to meet the minimum acceptable flow at the base of the riser and residual pressures as specified in the applicable NFPA Regulations as adopted and/or modified by these Regulations, plus outside hose stream requirements.

Exception: Hose stream allowance may be eliminated by the State Fire Marshal where there is no public or private water system supplying the automatic sprinklers.

3.2.3 Where the structure being considered is protected throughout by a residential sprinkler system, the required fire flow shall be modified to meet the designed sprinkler demand as hydraulically

calculated, plus estimated domestic demands during peak use times as determined by the water supplier.

3.3 Modification for Flammable and Combustible Liquids and Gases and Special Hazard Sites.

3.3.1 Where the site being considered contains flammable and combustible liquids and gas installations, the required fire flows are to be determined by the Office of the State Fire Marshal based on exposure hazards, aggregate capacity of the installation, the specific hazard of the installation, and as specified in the applicable NFPA Codes and Standards as adopted and/or modified by these Regulations.

3.3.2 Where the site being considered contains a bulk plant for liquefied petroleum gases and falls under the scope of Annex B of these Regulations, Modify NFPA 58, §3-10.4, Fire Protection at Bulk Plants, then the provisions of Annex B of these Regulations shall apply.

3.3.3 Where the site being considered contains outdoor tire storage or disposal operations and falls under the scope of Regulation 706, Chapter 5, then the provisions of Regulation 706, Chapter 5 shall apply.

3.3.4 Where, in the opinion of the State Fire Marshal, the site being considered constitutes or is in need of such a level of advanced designed or engineering criteria, the State Fire Marshal may require a Fire Protection Engineering Analysis in accordance with Regulation 701, Chapter 4, §9.0.

4.0 Water Distribution Systems.

4.1 Where water is available and a water distribution system is required for stand alone/detached one- and two family dwelling sites, the infrastructure for fire protection water shall be provided. The infrastructure for fire flow shall consist of properly listed and sized underground mains, stub ups for hydrants, and associated valves. The fire hydrants shall be installed prior to the fire flow requirements taking effect.

4.1.1 For purposes of this Regulation, water for fire protection shall be considered “available” whenever any portion of a proposed project’s property or any portion of a proposed subdivision is situated within one thousand (1000) feet of any portion of a water supplier’s new or existing infrastructure that includes water supply piping of 4 inches or more in nominal internal diameter. This measurement shall be calculated by way of accessible public thoroughfare(s) from the proposed property or subdivision and may not necessarily be a radius.

4.1.2 In the event the project or subdivision is situated in a geographical area that has been authorized to be provided with water service by a supplier other than the water supplier whose infrastructure is within the specified distance, the State Fire Marshal, on a case by case basis, may re-evaluate the requirements of §4.1.1.

4.2 The requirements of Fire Flow Table 1, with respect to the Standard on Water Supplies for Suburban and Rural Fire Fighting, NFPA 1142, as adopted and/or modified by these Regulations, may be applied to subdivisions of 25 or less lots of one and two family detached homes, where central water is provided. However, the requirement for water flow for fire protection shall be required when:

4.2.1 Additional development creates a subdivision in excess of 25 lots of detached one or two family dwellings or

4.2.2 In the opinion of the State Fire Marshal the probability of additional development will occur in excess of 25 lots of detached one or two family dwellings then the infrastructure for fire flow capability must be installed to accommodate the fire flow requirements.

4.3 The requirements of Fire Flow Table 2 shall take effect where water is available and be provided under the following circumstances:

4.3.1 For subdivisions of 50 or more lots of detached one and two family dwellings the water flow for fire protection shall be provided upon completion of the 50th lot, and prior to the development of the 51st lot.

4.3.2 For subdivisions of 26 through 49 lots of detached one and two family dwellings the water flow for fire protection shall be provided at the completion of the last lot to be built.

5.0 Fire Hydrants.

5.1 Spacing and Location.

5.1.1 Hydrant spacing as shown in the Fire Flow Tables shall be used as a general rule. Hydrants shall be located at the direction of the State Fire Marshal so as to minimize friction in fire hose. All hydrant spacing shall be located along available roads or at the direction of the State Fire Marshal. This measurement shall be calculated by way of accessible thoroughfare(s) from the building to be protected to the hydrant and may not necessarily be a radius.

5.1.2 Hydrants shall be provided in such a manner that all fire department connections and/or standpipe connections shall be within 300' of a hydrant and shall meet the provisions of the applicable NFPA Regulations as adopted and/or modified by these Regulations. This measurement shall be calculated by way of accessible thoroughfare(s) from the proposed fire department connection to the hydrant and may not necessarily be a radius.

5.1.3 Additional hydrants shall be provided when the State Fire Marshal deems it necessary based on the configuration of the site, building(s), exposures, construction, occupancy, and/or specific hazard(s).

5.2 Number.

5.2.1 The number of hydrants required shall be based on spacing and location requirements or number of required fire hydrants, whichever is greater.

5.2.2 Required fire hydrants shall be the number of fire hydrants required to extract the required flow from the distribution system in a form and arrangement usable by the fire department.

5.3 Installation.

5.3.1 Fire hydrants and water mains shall be installed in accordance with American Water Works Association Standard and all applicable NFPA codes and standards as adopted and/or modified by these Regulations.

5.3.2 Fire hydrants shall be supplied by not less than a six inch diameter main installed on a looped system or not less than an eight inch diameter main if the system is not looped or the fire hydrant is installed on a dead end main exceeding 300 feet in length.

5.3.3 Dead end mains shall not exceed 600 feet in length for main sizes under 10 inches in diameter.

Exception: Dead end mains exceeding 600 feet may be a minimum of 8 inches in diameter if an engineering analysis, acceptable to the Office of the State Fire Marshal, is submitted by a registered Professional Engineer demonstrating that the minimum flows and duration specified elsewhere in this Regulation are met or exceeded.

5.4 Other.

5.4.1 Fire hydrants installed in accordance with this requirement shall not be removed or shut down, except when repairs are necessary, without the permission of the State Fire Marshal.

5.4.2 The water supplier shall call the local fire dispatch center to report when a fire hydrant is taken out of service for repairs or maintenance. The supplier is to state the location and the approximate length of time the hydrant will be out of service. The supplier is to notify the local fire dispatch center when the hydrant is put back in service.

6.0 Storage Capacities.

6.1 Calculations for storage capacity shall be based on the following formula:

Required Flow x Duration x 102%

6.2 Storage capacity shall be calculated above system capacity. All required flows and storage capacities shall be designed above domestic demand.

7.0 Dry Hydrants.

7.1 Where there is not a public water system or a central water system, the State Fire Marshal may require the installation of a dry hydrant at the nearest public body of water to provide access to a water source for fire protection for all buildings of less than 10,000 square feet of aggregate gross floor area.

7.2 The provision in §7.1 of this Chapter for the providing of a dry hydrant shall also be meant that access to the dry hydrant and provisions for positioning fire apparatus to make use of the dry hydrant shall be provided.

7.3 The requirements of §7.1 and §7.2 of this Chapter shall meet the standards and specifications pursuant to the Construction Specifications for Dry Hydrant and Water Delivery Systems, Delaware 1991, prepared by the U. S. Department of Agriculture Soil Conversation Service and any updates thereto.

7.4 It is the responsibility of the developer, builder and/or owner to apply for and obtain any required permits for the installation of the dry hydrant.

7.5 It is the responsibility of the project developer, builder, and/or owner to provide the dry hydrants and any needed construction operations to place the dry hydrants in service.

7.6 All dry hydrants installed and accepted under this section shall be inspected, tested, and maintained in accordance with Regulation 703, Chapter 1, §4.9.

Fire Flow Table 1*

The requirements of Fire Flow Table 1 apply to rural areas where public, private, or central water is not available and where specified elsewhere in these Regulations.

Occupancy	Maximum Aggregate Gross Square Footage	Provide a fire alarm system per Ch. 6, §3.1.4	Minimum Set Back from all property lines	Maximum Height	Exposure Hazard on the Same Property	Internal Fire Separation	Apply
One & Two – Family Detached Dwellings	10,000	no	15’	3 Stories 35’	10’+	n/a	NFPA 1142
Multi-Family & Other Residential	10,000	no	15’	3 Stories 35’	10’+	n/a	NFPA 1142
Rowhouses & Townhouses	10,000	no	15’	3 Stories 35’	10’+	2-Hr rated wall Reg. 701 Chapter 2	NFPA 1142
Assembly	5,000	no	15’	1 Story 15’	10’+	n/a	NFPA 1142
Assembly[1]	5,001 to 10,000	YES	15’	2 Stories 30’	10’+	n/a	NFPA 1142
Health Care Business Education	10,000	no no no	15’	2 Stories 30’	10’+	n/a	NFPA 1142

Storage Industrial Mercantile	5,000	no no no	15’	To be reviewed on an individual basis	15’+	n/a	NFPA 1142
Storage[1] Industrial[1] Mercantile[1]	5,001 to 10,000	YES YES YES	25’	To be reviewed on an individual basis	15’+	n/a	NFPA 1142
Mini-Storage	5,000	no	15’	2 Stories 30’	15’+	n/a	NFPA 1142
Mini-Storage	5,001 to 10,000	no	25’	2 Stories 30’	15’+	n/a	NFPA 1142

[1] A fire alarm signaling system shall be provided. See §3.1.4.

***A-Fire Flow Table 1.**

The requirements of Fire Flow Table 1 apply to rural areas where public, private or central water is not available. Where Exposure Hazard, Same Property (EHSP) or Minimum Set Back from all property lines (MSB) cannot be met, the following table may be utilized.

	Maximum Aggregate Gross Square Footage	**Fire Separation Distance (or Exposure Hazard, Same Property)**	**Exterior Wall Fire Resistance Rating**
One- and Two-Family Detached Dwellings	10,000	Less than 10 feet	1-Hour
Multi-Family & Other Residential	10,000	Less than 10 feet	2-Hour
Rowhouses & Townhouses	10,000	Less than 10 feet	2-Hour
Assembly	10,000	Less than 5 feet	2-Hour
		5 to 10 feet	1-Hour
Health Care Business Education	10,000	Less than 5 feet	2-Hour
		5 to 10 feet	1-Hour
Storage Industrial Mercantile	10,000	Less than 5 feet	2-Hour
		5 to 15 feet	1-Hour
Mini Storage	10,000	Less than 5 feet	2-Hour
		5 to 15 feet	1-Hour

Fire Flow Table 2

The requirements of Fire Flow Table 2 apply to areas where there is a public, private, or central water system.

Occupancy	Maximum Aggregate Gross Square Footage	Internal Fire Separation	Flow Required	Hydrant Spacing
One- and Two-Family Detached Dwellings [1]	10,000	n/a	500 GPM 20 PSI Residual Pressure 1 Hour Duration	1,000 feet on center
Other Residential[1]	10,000	n/a	1,000 GPM 20 PSI Residual Pressure 1 Hour Duration	800 feet on center
Rowhouses[1] & Townhouses[1]	10,000	2-Hr rated wall Reg. 701 Chapter 2	1,000 GPM 20 PSI Residual Pressure 1 Hour Duration	800 feet on center
Assembly Health Care Business Education	10,000	n/a	1,000 GPM 20 PSI Residual Pressure 1 Hour Duration	800 feet on center
Storage Industrial Mercantile	10,000	n/a	1,500 GPM 20 PSI Residual Pressure 2 Hour Duration	800 feet on center
Mini-Storage	10,000	n/a	750 GPM 20 PSI Residual Pressure 1 Hour Duration	800 feet on center

[1]Sites in New Castle County are subject to the provisions of New Castle County Code Chapter 40 Article 5. See Note on §1.4.1 and §1.4.2.

Note: Fire Flow Table 2, Hydrant Spacing. The phrase, “on center” is intended to represent the maximum distance fire hydrants are spaced from each other. Proper application of this intention would generally provide a fire department with a maximum “hose lay” to a hydrant that would not exceed 500 feet for One & Two Family Dwellings, and 400 feet for all other structures.

Fire Flow Table 3

It is the intent of Fire Flow Table 3 to allow a credit for water flow that is available on site, but does not meet the full water flow requirements of Fire Flow Table 2. However, the available water flow on site shall be a minimum of 500 GPM, otherwise the requirements of Fire Flow Table 1 shall be applied to the site. This Table does not apply to new public, private, nor central water systems, including municipalities.

Occupancy	Maximum Aggregate Gross Square Footage	Minimum Set Back from all property lines	Exposure Hazard on the Same Property	Internal Fire Separation
One- and Two-Family Dwellings, Multi-family, and Other residential	10,000	*15’	*10’+	n/a
Rowhouses Townhouses	10,000	*15’	10’+	Two Hour Rated Design Wall Reg. 701, Chapter 2
Assembly	10,000	*15’	*10’+	n/a
Health Care Business Education	10,000	*15’	*10’+	n/a
Storage Industrial Mercantile	10,000	*25’	*15’+	n/a
Mini Storage	5,000	*15’	*15’+	n/a
Mini Storage	5,001 to 10,000	*25’	*15’+	n/a

Note: Fire Flow Table 3: For example, if 1,000 GPM is required for a 9,000 sq. ft. Business Occupancy, but only 500 GPM is available, or 50%, then the required setbacks shall be reduced by 50% so that the Minimum Setback (MSB) from property lines would be 7.5 feet, instead of 15 feet, and the Exposure Hazard on the Same Property (EHSP) would be five feet, instead of ten feet.

Chapter 7 Minimum Requirements for Water Suppliers

1.0 General.

1.1 Scope.

1.1.1 This Chapter establishes the minimum requirements for all water suppliers when extending or improving their franchise district, their coverage areas, their distribution, transmission or supply infrastructure and any modifications to their water supply systems.

1.1.2 Where this Chapter provides minimum standards and specifications for water suppliers to be in conformance with, such standard and specifications found in this Chapter are not to be construed as lessening any requirements of Chapter 6 of this regulation, which may require additional flows, durations, and/or fire hydrants at the time of construction or site development.

1.2 Purpose.

1.2.1 The purpose of the Chapters is to provide minimum requirements for water flow for fire protection in duration and amounts required and the installation of fire hydrants by water suppliers.

1.3 Application.

1.3.1 This Chapter is applicable to all water suppliers, be they public, private, corporations, companies, or individual(s) when providing water for any occupancy, development or sub-division; and shall apply when extending or improving their franchise districts, their coverage areas, their distribution, transmission or supply infrastructure, and any modifications to their water systems.

1.3.2 This Chapter does not apply to sources of water from individual wells when supplying an individual one- and two-family dwelling.

1.4 Definitions.

1.4.1 The definitions as found in the section shall be in addition to the definitions found in other sections of these Regulations and shall be applicable to Chapter 6 of this regulation.

"**Central or Public Water System**" shall mean all suppliers of or providers of water with the exception as noted in §1.3.1 of this Chapter.

"**Distribution, Transmission or Supply Infrastructure**" shall mean all mains, water lines, distribution, transmission or supply mains or lines, fire hydrants, fittings, connections, tanks, and all equipment intended for water distribution.

2.0 Minimum Flows.

2.1 All water suppliers covered under the provisions of this Chapter shall provide a minimum flow of water to all areas of their system of at least 500 GPM above calculated domestic demand at a residual pressure of at least 20 PSI.

3.0 Minimum Duration.

3.1 All water suppliers covered under the provisions of this Chapter shall provide a water supply capable of the minimum flow of 500 GPM at a residual pressure of at least 20 PSI for at least two (2) hours. Where the water supply serves only one and two family dwellings, it shall be capable of the minimum flow of 500 GPM at a residual pressure of at least 20 PSI for at least one (1) hour.

4.0 Hydrants.

4.1 Fire hydrants shall be located as specified in Chapter 6 of this regulation for all occupancies and structures and buildings found within the State Fire Prevention Regulations.

4.2 Notwithstanding the provisions of §4.1 of this Chapter of this Regulation, fire hydrants shall be located as prescribed for the hazard by the State Fire Marshal.

4.3 When a water supplier is extending any transmission, distribution or supply water main or piping, fire hydrants shall be installed so as not to exceed a maximum distance of 2,000 feet between hydrants.

5.0 Installation.

5.1 Fire hydrants and water mains shall be installed in accordance with American Water Works Standards; the Standard for the Installation of Private Fire Service Mains and Their Appurtenances, NFPA 24, as adopted and/or modified by these Regulations; and in conformance with accepted engineering principles and practices.

5.2 The Water Supplier shall coordinate with the local Fire Department, to assure that the operation of the fire hydrant, including the direction of force needed to open the hydrant, is consistent with all other hydrants within the fire department's district as approved by the State Fire Marshal.

5.3 The Water Supplier shall coordinate with the local Fire Department, to assure that all the characteristics of the hose connections and pumper connections on all new hydrants are consistent with all other hydrants within the fire department's district as approved by the State Fire Marshal. The characteristics of these connections shall include, but not be limited to, the internal diameter of the openings, the outside (thread) diameter of the connections, the number of threads per inch, the configuration of the thread, and the depth of the thread.

5.4 As fire hydrants are replaced for whatever reason, including replacement of damaged hydrants, the water supplier shall install only hydrants that meet the operational criteria and thread specifications stated above.

6.0 Auxiliary Power Supply.

6.1 All water suppliers that depend on electrically driven pumps to sustain the water distribution systems must provide auxiliary power systems to drive the pumps in the event of an electrical failure that will render the electric pumps out-of-service.

7.0 Submission of Plans.

7.1 All water suppliers must submit engineering grade plans, hydraulic calculations, pump data, and other required specifications to the Office of the State Fire Marshal for review and approval, pursuant to the State Fire Prevention Regulations with respect to submission of plans and fees, for all work when extending or improving their franchise districts, their coverage areas, their distribution transmission or supply infrastructure, and any modifications to their water systems.

1 DE Reg. 197 (08/01/97)

6 DE Reg. 1638 (06/01/09)

8 DE Reg. 416 (09/01/04)

10 DE Reg. 342 (08/01/06)

13 DE Reg. 629 (11/01/09)