

140 FIRE PROTECTION

140.01 FIRE HYDRANTS

140.01.01 Location

140.01.01.01 All fire hydrants shall be installed on a minimum 6 inch water line. Only one fire hydrant shall be installed when the line is served by a 6 inch tap and is not looped to another main. There shall be at least one fire hydrant at each street intersection. Valves associated with fire hydrant assemblies shall be located within 15 feet of the fire hydrant. See Detail 120.08 for more information on hydrant locations.

140.01.01.02 In residential districts the maximum distance between hydrants, measured along street centerlines, shall be 500 feet.

140.01.01.03 In non-residential zoning (Commercial, Industrial, and Multi-Family) the maximum distance between hydrants, measured along street centerline, shall be 400 feet.

140.01.01.04 On streets of Type 8 and above with access points only at street intersections, hydrants shall be located at each street intersection and at 1000 foot intervals along the street. Where these intersections are less than 1200 feet apart, no hydrant is required between the intersections.

140.01.01.05 The Fire Department may require fire hydrants to be placed in a staggered arrangement on both sides of any street. This decision will be at the discretion of Office of the Fire Marshal.

140.01.01.06 If a water line is installed along an area of undeveloped land the fire hydrants shall be placed at 1000 foot intervals. If properties along this section of water line develop in the future, fire hydrants shall be required to be placed on the side of the road in which the development takes place, if not already located on that side of the road.

140.01.01.07 New buildings, or additions which result in a total building area of 10,000 square feet, require hydrants to be installed at 400 foot intervals along all sides of the building that are accessible to fire engines.

140.01.01.08 These hydrants shall be at least 40 feet from the building. The total number of hydrants shall not exceed one hydrant per separation of buildings plus one hydrant per 10,000 square feet of floor space.

140.01.01.09 All premises, where buildings or portions of the building are located more than 400-feet (commercial) from a fire hydrant, shall be provided with approved on-site fire hydrants and water mains capable of supplying the fire flow required by the Fire Department. The location and number of on-site fire hydrants shall be as designated by the Office of the Fire Marshal, with the minimum arrangement being so as to have a hydrant available for distribution of hose to any portion of any building at distances not exceeding 400-feet of hose length.

140.01.01.10 A fire hydrant shall be installed within 100 feet of a building's fire department connection (FDC).

140.01.02 Specifications

140.01.02.01 Hydrants shall conform to AWWA C502 with a minimum valve opening of 4 1/2 inches. Hydrants shall be furnished with a 4 1/2-inch steamer and double 2 1/2-inch hose connections with caps and chains, National Standard Threads, mechanical joint, 1 1/2-inch pentagon operating nut, open left, bronze to bronze seating, a minimum 4 foot bury depth with a break away ground line flange and break away rod coupling. The hydrant bonnet shall be designed with a sealed oil or grease reservoir with O-ring seals and a Teflon thrust bearing. Fire hydrant caps shall be attached to the body of the hydrant with a minimum 2/0 twist link, heavy duty, non-kinking, machine chain. All fire hydrants shall be designed for a working pressure of 250-psi or greater. Fire hydrants shall be provided from a manufacturer listed in the Approved Manufacturer's List.

140.01.02.02 Fire hydrants shall be painted with two coats of paint in the following manner. Fire hydrant bodies shall be painted safety red. The bonnets and caps are to be painted metallic aluminum. The utility Contractor may choose to perform field painting after the flow capacity is confirmed by field testing. The following paints are to be used:

140.01.02.02.01 Ace Hardware Rust Stop Safety Red (Gloss) 225A123

140.01.02.02.02 Ace Hardware Rust Stop Metallic Aluminum 225A110

140.01.02.03 All new fire hydrants shall be provided with a 5 inch Storz / quick connect coupling on the steamer outlet (see detail 120.07).

140.01.03 Installation

140.01.03.01 Hydrants shall be set plumb, properly located with the pumper nozzle facing the closest curb of a fire lane or street, but not a parking space. The back of the hydrant opposite the pipe connection shall be firmly blocked against the vertical face of the trench with 1/3 cubic yard of concrete. Double bridle rods and collars shall be connected from the tee to the hydrant. Rods shall not be less than 3/4 inch diameter stock and coated with bituminous paint. A minimum of 8 cubic feet of stone shall be placed around the drains. The backfill around the hydrants shall be thoroughly compacted. Hydrant tees and mechanical restraints may be used upon approval of the Town Engineer. See Detail 120.07 for fire hydrant installation.

140.01.03.02 For fire hydrant installations outside of intersections, the utility Contractor may choose to utilize One-Bolt fittings in combination with Aqua-Grip gate valves and Aqua-Grip fire hydrants without typical blocking and rodding. In this case, the hydrant line shall be fabricated with restrained joints.

140.01.03.03 A clear level space of not less than three (3) feet shall be provided and maintained on all sides of a fire hydrant for immediate access. Clearance from the finished grade to the steamer outlet shall be between eighteen (18) inches and twenty-four (24) inches.

140.01.03.04 Fire hydrants which have been installed shall be tagged “OUT OF SERVICE” by the utility contractor until such time as the water main to which it is connected is disinfected and connected to the active water distribution system. Oil or grease reservoirs in the hydrant bonnet shall be refilled after installation and adjustment.

140.01.04 Publicly-Owned Fire Hydrants on Private Property

140.01.04.01 Additional fire hydrants on private property are required to meet the requirements of the North Carolina Fire Prevention Code or the Office of the Fire Marshal, and may be required to be publicly conveyed to be part of the Water Distribution System under either one of the following conditions:

140.01.04.01.01 If the Town Engineer determines that an extension of a water main with fire hydrants across the private property, to be part of the Water Distribution System, is necessary for the overall public benefits of the Water Distribution System, and the private property owner grants a public utility easement across the entire property for such purpose.

140.01.04.01.02 If a 6-inch or larger branch water line with fire hydrant is extended not greater than 25 feet beyond the public right-of-way or easement where the water main is located, provided continuous access by fire engine or water service and maintenance equipment is provided and the hydrant is visible along such access, and a public utility easement is granted over the water line to the hydrant.

140.01.05 Hydrants on Private Water Distribution Systems

140.01.05.01 Private water systems which are to be served by a well or wells shall be constructed to Town standards except that the Owner/Developer shall install fire hydrant tees, branch valves, and hydrant legs 3 feet behind the back of curb or 3 feet beyond edge of pavement. The hydrant leg shall be plugged with a 6-inch plug and the plug shall be rodded from the main and blocked. The branch valve shall be closed. The Owner/Developer shall furnish hydrants to the Town at the time the Town approves the water system. The Town will install the fire hydrants when the water system is connected to the municipal system. Spacing of fire hydrant tees shall be in full accordance with the requirements for fire hydrant spacing outlined elsewhere in these Standard Specifications.

140.01.06 Final Acceptance

140.01.06.01 Upon completion of installation and testing of water lines and prior to combustible construction, the “Fire Hydrant Acceptance Form” must be completed by the Utility Contractor and the Town, and the fire hydrant placed into service.

140.01.06.02 The “Fire Hydrant Acceptance Form” is included in the Appendix. All of the required information on the form shall be provided, the required testing and signoffs from the various Town departments shall be received, and a copy of the complete form shall be received by the Fire Department prior to final acceptance of the fire hydrant.

140.02 FIRE FLOW REQUIREMENTS

140.02.01 All water distribution system extensions shall provide water pressures and fire flows at a standard acceptable value for the applicable zoning requirements. Although the overall volume of water used for fighting fires is quite low relative to most other uses, the rate at which it must be supplied places a heavy, short-term drain on the system. Various types of forecasting models may be used; the least complex of which is a single-coefficient method used herein. Here, the projected demand is based on a factor relating to the type of construction and square footage of the structure. The required fire flow for single family developments is listed in Table 140.01 and is based on square footage of the homes. The required fire flow for commercial, multi-family, industrial and institutional developments is listed in Table 140.02 which is based on the ISO Guide for Determination of Needed Fireflow equation for construction. In cases where the building square footage is greater than 78,000 square feet or where exposure, communication, or occupancy is determined to be a mitigating factor by the fire marshal, additional analyses in accordance with the ISO Guide for Determination of Needed Fireflow will be required. In all cases, the final fireflow requirement will be determined by the Fire Marshal in consultation with the Public Utilities Director and Director of Engineering. Regardless of the indicated fireflow from the table, single family residential shall require a minimum fireflow of 1000 gpm and commercial construction shall require a minimum fireflow of 1,500 gpm.

140.03 PROJECTS THAT REQUIRE WATER BASED FIRE PROTECTION SYSTEMS

140.03.01 Four (4) complete sets of working plans and calculations for all fire sprinkler systems and standpipe systems shall be submitted as required for review and approval. If 20 sprinkler heads or more are modified or added to an existing sprinkler system, complete plans and calculations shall be required. All fire sprinkler systems shall be installed with an alarm check valve in each riser with all the trimmings (example: retard chamber, water motor gong, pressure gauges, etc.). All installations, minor repairs, or minor replacements shall be performed by a licensed fire sprinkler contractor. Contact the Office of the Fire Marshal for permit applications.

140.03.02 Approved working plans shall be in complete compliance with applicable North Carolina Fire Prevention Codes, NFPA Standards and Town Specifications. NFPA 13 above ground material and test certificate and NFPA 24 underground material and test certificate are required after completion of designated, approved work.

140.03.03 If a system is hydraulically designed, the following design criteria shall be followed:

140.03.03.01 A fire flow test must be performed by a professional Engineer to document required fire flow.

140.03.03.02 A 10 PSI safety margin shall be included in all hydraulic calculations. System supply shall equal or exceed 1.1 times that of the system demand. (Example: Demand = 50 psi, Supply = 55 psi)

140.03.03.03 A minimum of 500 gpm outside hose allowance shall be calculated on all sprinkler systems. Interior hose allowances are to follow NFPA 13 requirements.

140.03.03.04 The minimum residual water pressure of 20 psi as stated above shall be maintained in the distribution system at all times.

140.03.04 When a fire protection system is proposed, a double check valve assembly including 2 check valves, 2 OS & Y gate valves, and 4 test cocks shall be installed on the supply side of the sprinkler fire protection line. These backflow prevention devices shall be UL listed and/or listed by Factory Mutual Research Corporation. See approved equipment list.

140.03.05 A post indicator valve (PIV) shall be provided at the right of way or edge of easement (preference: listed indicating valves at each connection into the building at least 40 feet from building if space permits). The top of the PIV shall be 36 inches above finished grade. All PIVs shall be made of DIP construction and be listed on the Approved Manufacturer's List. Bollard protection shall be provided for the PIV in accordance with the North Carolina Fire Prevention Code Section 312.

140.03.06 Where automatic fire sprinkler systems are used, a fire department connection shall be provided. The fire department connection shall be located within 100 feet of a fire hydrant. The FDC shall be a 5 inch Storz/quick connection. All other fire department connections shall be approved by the Office of The Fire Marshal. See approved equipment list and details.

140.03.07 A dedicated sprinkler riser room is required providing an entry door to the room from the exterior of the building in accordance with NC Building Code shall be provided. The exterior riser room door plus all other required or Town designated fire exits shall have a protected clearance of 5 feet from any obstruction by vehicular movement by means of curbing, bollards, or concrete bumpers.

140.03.08 The exterior door leading to the dedicated sprinkler riser room shall be labeled with minimum 2-inch lettering designating "SPRINKLER RISER ROOM" in a contrasting color.

140.04 Lock Box Requirements

140.04.01 Key Box requirements – See Town ordinance Section 3-2004.

140.04.02 Hazardous Materials Data Storage Box requirements- See Town Ordinance Part 8, Chapter 9.

140.04.03 A key Box is required where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life saving or firefighting purposes. The Office of the Fire Marshal is authorized to require a Key Box to be installed in an approved location.

140.04.04 A Key Box or gate switch may be required on security gates that are installed across approved fire apparatus roads

140.04.05 The Key Box shall be mounted within 5 feet of the approved fire department entrance door and at a height of 5 feet AFF.

140.04.06 Key Box shall be in place before the certificate of occupancy is issued.

140.04.07 Key Box order information may be obtained through Office of the Fire Marshal.

140.05 FIRE ACCESS AND FIRE LANES

140.05.01 Fire Access

140.05.01.01 General

140.05.01.01.01 The following guidelines represent the Town's efforts to maintain consistency concerning Fire Department emergency access. It is the Town's responsibility to ensure adequate access for the Fire Department and other responding agencies. The Town therefore reserves the right to require modifications to established requirements if, in the Town's opinion, the access cannot be provided or may be compromised.

140.05.01.01.02 Examples of the town-approved roadway, turnaround, and turning radius specifications for emergency vehicles are provided in Appendix A. The last of these pages may be photocopied onto a transparency as a template for Fire Department turn radius requirements. This is the template used by the Office of the Fire Marshal when reviewing plans to determine proper access and is based on the actual size of our firefighting apparatus.

140.05.01.01.03 All access roadways shall be built to street standards as described in Section 060. The roadway design shall be prepared and certified by a Design Professional. All required access roadways shall be properly maintained and kept clear for emergency use at all times. Any alternatives to these specifications shall be reviewed and approved by the Office of the Fire Marshal prior to construction.

140.05.01.01.04 **FIRE APPARATUS ACCESS ROAD** – 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, parking lot lane and access roadway.

140.05.01.01.05 **FIRE LANE** – A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

140.05.01.01.06 Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of the North Carolina Fire Prevention Code and Town Standards and shall extend to within 150 feet of all portions of the facility or all portions 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. The fire official is authorized to increase the 150 feet where:

140.05.01.01.06.01 The building is equipped throughout with an approved automatic sprinkler system installed in accordance with the North Carolina Fire Prevention Code and applicable standards.

140.05.01.01.06.02 Fire apparatus access roads cannot be installed due to location on property, topography, waterways, non-negotiable grades or other

similar conditions, and an approved alternative means of fire protection is provided.

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

140.05.01.01.07 Fire department apparatus access to buildings used for high-piled combustible storage shall comply with the applicable provisions of Chapter 23 of the North Carolina Fire Prevention Code.

140.05.01.01.08 Fire apparatus access roads shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 13 feet 6 inches.

140.05.01.01.09 The Office of the Fire Marshal shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.

140.05.01.01.10 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.

140.05.01.01.11 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.

140.05.01.01.12 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 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 code official.

140.05.01.01.13 The grade of the fire apparatus access road shall be within the limits established by the code official based on the fire department's apparatus.

140.05.02 Gates

140.05.02.01 Gates securing the fire apparatus access roads shall comply with all of the following criteria:

140.05.02.01.01 The minimum unobstructed gate width shall be 20 feet.

140.05.02.01.02 Gates shall be of the swinging or sliding type.

140.05.02.01.03 Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.

140.05.02.01.04 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 Office of the Fire Marshal.

140.05.02.01.05 Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools; locking device specifications shall be submitted for approval by the Office of The Fire Marshal.

140.05.02.02 The Office of the Fire Marshal 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 streets, alleys or highways.

140.05.02.03 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 shall not be trespassed on or used unless authorized by the owner and the Office of the Fire Marshal.

140.05.02.04 The installation of security gates across a fire apparatus access road shall be approved by the Office of the Fire Marshal. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be listed in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

140.05.03 Two Points of Access

140.05.03.01 The Office of The Fire Marshal 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.

140.05.03.02 When two points of access are required, they shall be placed a distance apart of at least one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses. The Town shall not allow the second access point to be limited to use by emergency responders only. The second access shall always be available for public use in case the other access is blocked.

140.05.03.03 Buildings or facilities located in Commercial and Industrial Developments and exceeding 30 feet or 3 stories in height shall have at least 2 means of fire apparatus access. Buildings or facilities having a gross building area of more than 62,000 square feet shall have at least 2 means of fire apparatus access. If the buildings or facilities are provided with an approved automatic fire sprinkler system, the gross building area can be increased to 124,000 square feet with one access road.

140.05.03.04 Fire apparatus access roadways shall have a minimum unobstructed width of 26 feet in the immediate vicinity of any building or portion of building more than 30 feet in height. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet and a maximum of 30 feet from the building, and shall be positioned parallel to one entire side of the building.

140.05.03.05 Maintenance of the required access shall be considered during the planning stages and installation of Fire Department access roadways, fire hydrants, or connections. This includes the potential growth of trees and/or other vegetation over the years.

140.05.04 Fire Lanes

140.05.04.01 A plan shall be submitted for approval to the Office of the Fire Marshal which indicates all fire lanes and proposed fire lane sign placements for the project site.

140.05.04.02 The general requirement designates that any building located more than 150 feet from a public road, or which exceeds 30 feet in height and is set back more than 50 feet from a public road, shall have a fire lane.

140.05.04.03 Fire lanes shall be a minimum width of 20 feet and shall be properly marked and signed to designate the access as a "fire lane" as specified by the Office of the Fire Marshal. The surface of the fire lane shall be paved with a minimum of 8 inches of ABC stone and 2.5 inches of S 9.5B asphalt.

140.05.04.04 All fire lanes shall be marked in accordance with one of the following requirements:

140.05.04.04.01 Continuously painted yellow striping along the fire lane with "No Parking - Fire Lane" printed with minimum 8-inch high letters at 40-foot intervals or as directed by the Office of the Fire Marshal;

140.05.04.04.02 Continuously painted yellow curb along the fire lane with "No Parking - Fire Lane" printed with minimum 8-inch high letters at 40-foot intervals or as directed by the Office of the Fire Marshal;

140.05.04.04.03 The installation of the MUTCD standard sign showing "No Parking - Fire Lane" placed at each end of the fire lane and at 50-foot intervals with arrows on the signs or a continuously painted yellow strip along both sides of the fire lane (or an additional sign beneath the fire lane sign lettered as "both sides"). Signs shall be a type R8-31 or equivalent reflective sign no less than 12 inches x 18 inches in size, white background, with the wording "No Parking - Fire Lane" in red letters. Signs shall be posted at the following minimum heights.

140.05.04.04.03.01 60 inches to the top of the sign when pedestrians do not pass by or under the sign. This application includes signs mounted on the building face, a column, or other fixed mounting surface;

140.05.04.04.03.02 84 inches to the top of the sign when the pedestrian path does pass by or beneath the sign. This application includes signs mounted on a fixed metal post located in a sidewalk and/or traffic island.

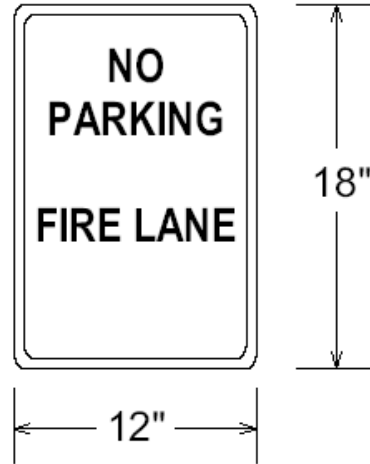
SIGN TYPE "A"



SIGN TYPE "C"



SIGN TYPE "D"



140.05.04.05 The above fire lane requirements shall also apply to all fire hydrant islands located along the face and sides of a hydrant.

140.05.04.06 Fire Lanes shall be installed and inspected in accordance with Section 060 of these Standard Specifications as well as the North Carolina Fire Prevention Code. The Office of the Fire Marshal shall have the authority to designate fire lanes as deemed necessary for Fire Department access.

140.05.04.07 Roadways, driveways, and access ways shall not be marked as fire lanes without first obtaining approval from the Office of the Fire Marshal.

140.06 FIRE SAFETY DURING CONSTRUCTION

140.06.01 Open Burning -There shall be no open burning within the Town's jurisdiction.

140.06.02 Fire Safety during construction, alteration, or demolition shall be maintained according to the North Carolina Fire Prevention Code and other applicable provisions of NFPA 241. The Fire Safety Construction Checklist shall be reviewed and signed prior to the construction project beginning. This checklist is provided in Section 180 of this document or may be obtained from the Office of the Fire Marshal.

140.06.03 Fire safety during construction and demolition is essential to maintain a safe and efficient project. The use of temporary heating equipment, flammable and combustible liquids storage, use and dispensing, explosives storage, handling and use, and all other general fire safety requirements shall be adhered to according to Chapter 14 of the North Carolina Fire Prevention Code.

140.06.04 Vehicle access for firefighting shall be provided to all construction or demolition sites. Vehicle access shall be provided within 100 feet of temporary or permanent fire department connections. Vehicle access shall be provided by either temporary or permanent roads, capable of supporting vehicle loading under all weather conditions.

140.06.05 The fire protection water supply system, including fire hydrants, shall be installed and be in at least the functional status prior to placing combustible materials on the project site. If phased construction is planned, coordinated installation of the fire protection water system is permitted.

140.06.06 Any existing fire hydrant removed from service due to construction/demolition activities shall be placed back into service by the Owner/Developer within 14 calendar days from the date it was taken out of service.

140.06.07 The Fire Department shall be notified at least 24 hours before fire hydrant or water line impairment.

Table 140.01 – Single and Two Family Dwelling Required Fireflow		
Square Footage	Fireflow	Duration
1-3,500	1,000	2
3,501-4,800	1,250	
4,801-6,200	1,500	
6,201-7,700	1,750	
7,701-9,400	2000	

Table 140.02 – Commercial/Multi-Family/Industrial/Institutional Required Fireflow

Square Footage					Fireflow	Duration
Type V	Type III	Type IV	Type IIB	Type IA IIB IIA		
1-3,000	1-7,000	1-8,500	1-11,000	1-20,000	1,500	2
1,501-2,150	3,501-5,000	4,001-6,000	5,001-7,500	9,001-13,500	1,500	
2,151-3,000	5,001-7,000	6,001-8,500	7,501-11,000	13,501-20,000	1,500	
3,001-4,200	7,001-9,500	8,501-11,800	11,001-15,000	20,001-26,500	1,750	
4,201-5,500	9,501-12,500	11,801-16,000	15,001-20,000	26,501-35,000	2,000	
5,501-7,000	12,501-16,000	16,001-20,000	20,001-25,000	35,001-43,500	2,250	
7,001-8,500	16,001-20,000	20,001-23,501	25,001-30,000	43,501-55,000	2,500	
8,501-10,400	20,001-23,500	23,501-29,000	30,001-36,500	55,001-65,000	2,750	
10,401-12,500	23,501-28,000	29,001-35,000	36,501-43,500	65,001-78,000	3,000	3
12,501-17,000	28,001-38,000	35,001-47,500	43,501-60,000	>78,000	3,500	
17,001-22,000	38,001-50,000	47,501-60,000	60,001-78,000		4,000	4
22,001-28,000	50,001-65,000	60,001-78,000	>78,000		4,500	
28,001-35,000	65,001-78,000	>78,000			5,000	
35,001-42,000	>78,000				5,500	
42,001-50,000					6,000	
50,001-58,000					6,500	
58,001-68,000					7,000	
68,001-78,000					7,500	
>78,000					8,000	

*In cases where the building square footage is greater than 78,000 square feet or where exposure, communication, or occupancy is determined to be a mitigating factor by the fire marshal, additional analysis in accordance with the ISO Guide for Determination of Needed Fireflow will be required. In all cases, the final fireflow requirement will be determined by the Fire Marshal in consultation with the Public Utilities Director and Director of Engineering.