

# **APPENDIX 2**

Augusta County Fire Flow & Hydrant Standards

## **#1 – Augusta County Fire Flow Policy**

### Purpose:

The purpose of this policy is to set forth general procedures regarding the Fire Flow Policy.

### General Policy:

- 1) **Single Detached Residential Structures:** The minimum fire flow for a single detached residential structure should be 500 GPM by the minimum Insurance Service Office (ISO) residential requirement. During the rezoning and master plan process, the Augusta County Service Authority will assist the County's Community Development Department and the Fire Chief with a review of preliminary estimates of flow capabilities as a Service Authority system in the development area.
- 2) **Other Structures:** Fire flow requirement for other structures will be based on the Insurance Service Office (ISO) calculated on square footage, construction method and occupancy. All fire flow calculations will be evaluated on each individual case.

All extensions and/or expansions of public water systems should be designed in accordance with the current Augusta County Service Authority Construction Standards and Level of Service and Design Standards. Systems should be designed to maximize the available flow for the planned area or for future development within the area. The Fire Chief will also review hydrant location and/or fire protection system connections for buildings.

# Augusta County Fire Protection Design Guidelines

## A. Fire Hydrants

The Fire Chief shall have the authority to require the installation of fire hydrants as deemed necessary to have water available for fire fighting purposes prior to the use of combustible materials in construction being commenced on any floor above the first or ground floor level. Such hydrants shall be accessible to fire fighting apparatus at the time they are installed and at all times thereafter. The need for such fire hydrants will be determined by the use and size of the structure involved in accordance with Augusta County Fire Flow Policy and the availability of water in the area of the property. The number of fire hydrants, their placement, and the desired fire flow shall be determined by the standards and specifications of this article.

Where no public utilities are available for fire protection, the Fire Chief may require the placement of dry hydrants or other means of fire protection dependent upon site conditions, the proposed use, and type of construction.

### Hydrant Design and Placement

1. Fire hydrants shall be generally located at street intersections and at the ends of streets ending in cul-de-sacs. Fire hydrants shall not be installed on lines less than 6 inches in diameter.
2. Fire hydrants shall be connected only to water systems adequately designed for fire flows and domestic flow.
3. For Master Plans, the separation between fire hydrants shall generally be as follows:
  - a. Single family detached developments shall be 600 feet to 800 feet maximum.
  - b. Townhouses, apartment, commercial, office, industrial, and mixed-use developments shall be a maximum of 500 feet for industrial/heavy commercial and 800 feet for light commercial/residential.

Additional hydrants may be required based on the type and density of construction.

The maximum distance measured along the centerline of the street or public right of way to the structure shall be as follows:

- a. Industrial Buildings – 250 feet
- b. Commercial and Office Buildings – 400 feet
- c. Churches and Schools – 400 feet
- d. Apartments, Multi family, Townhouses – 350 feet

- e. Single Family Duplex – 400 feet
- f. Single family dwellings – 500 feet from lot line
- g. Mobile Home Parks – 500 feet

Additional hydrants may be required as deemed necessary by the Augusta County Fire Chief.

4. A fire hydrant shall be provided within 50 feet of the fire department connection or to any fire protection systems located within the building.
5. Hydrants shall be installed either 5 feet from the point of curvature of curb returns or 10 feet from the property line/right of way line in subdivisions in accordance with ACSA standards.
6. Hydrants shall be located as follows:
  - a. Curb and Gutter Streets: typically 3 feet from the face of the curb, but not less than 18 inches and not more than 12 feet behind the face of the curb, unless approved by the Fire Chief.
  - b. Ditch Sections Streets: typically 6 feet from the edge of the shoulder or as required by VDOT, but not more than 12 feet beyond the edge of the pavement, unless approved by the Fire Chief.
7. If hydrants are to be located in an area of possible guardrail construction, plans should be checked for notes regarding possible obstruction.
8. No plantings or the erection of other obstructions shall be made within 5 feet of any fire hydrant, or within 10 feet of a fire department connection.
9. In developments where no public water supply system is available, a dry fire hydrant may be required as determined by the Fire Chief. The dry fire hydrant shall be designed, constructed and located according to the Fire Chief.

## **B. Fire Hydrant Specification**

All fire hydrant design and installation shall be in accordance with the current standards as set forth by the Augusta County Service Authority, both on public or private streets and in easement areas.

1. The 4 ½ inches nozzle shall face the street, travel lane, service drive, fire lane or vehicular travel-way where accessible or as approved by the Fire Chief.

2. Fire hydrants placed on streets without curb and gutter shall have the 2 ½ inches hose connection a minimum clearance of 5 feet from the side slopes or fixed objects.
3. The bottom of the safety flange shall be 2 inches above the elevation of the edge of the shoulder on the streets without curb and gutter and above the elevation of the curb on streets with curb and gutter.

### **C. Fire Department Connections**

When fire suppression systems require a connection through which the fire department can pump water into the sprinkler, a standpipe or other system furnishing water for fire extinguishment makes a desirable auxiliary supply. For this purpose one or more fire department connections (FDC) shall be provided.

1. There shall be no shutoff valve in the fire department connection
2. In the fire suppression system, the fire service piping shall be installed in compliance with current NFPA Standards and the IBC Standards. NFPA allows for this piping to be installed in a vault or inside the structure.
3. Fire department connections shall be on the street side of buildings and shall be located and arranged so that hose lines can be readily and conveniently attached to the inlets without interference from nearby objects including buildings, fences, posts or other obstructions.
4. The height of the fire department connection shall be 36 inches from the ground surface to the operating features.
5. Fire department Siamese connections shall be provided with break away caps at the time of installation to prevent vandalism and such caps will be maintained by the property owner.
6. Fire department connections will be painted a contrasting color to the building or its surroundings.
7. Specifications acceptable to the Augusta County Fire Chief for FDCs are found in the NFPA 24 Standards.

## **Post Indicator Valves**

Every connection from the fire service main to a building shall be provided with a listed indicating valve so located as to control all sources of water supply except fire department connections.

1. Post Indicator Valves (PIV) shall be located not less than 40 feet from the buildings being protected.
2. The height of the PIV shall be 36 inches from the ground surface to the operating features.
3. The PIV shall be located within 15 feet of the FDC. Plate 2-10
4. Tamper switches or monitoring in accordance with current NFPA Standards shall be provided on each PIV unless specifically waived by the Fire Chief.
5. A PIV is not required in applications where tamper switches are provided on the OS&Y valves located within the building.
6. Specifications acceptable to the Augusta County Fire Chief for PIVs are found in the NFPA 24 Standards.

Augusta County Fire Flow required by ISO for Commerical, Business and Multi-Family Buildings

Factor 1.5

Type 5 construction to include: Unprotected wood frame  
 ISO Class I Protected wood frame - 1/2" gypsum board protected  
 Unprotected ordinary or heavy timber

GPM	Square Footage of Building		GPM	Square Footage of Building	
500	500		4250	23,300 to	26,300
750	500 to	1,100	4500	26,300 to	29,300
1000	1,100 to	1,700	4750	29,300 to	32,600
1250	1,700 to	2,600	5000	32,600 to	36,000
1500	2,600 to	3,600	5250	36,000 to	39,600
1750	3,600 to	4,800	5500	39,600 to	43,400
2000	4,800 to	6,200	5750	43,400 to	47,400
2250	6,200 to	7,700	6000	47,400 to	51,500
2500	7,700 to	9,400	6250	51,500 to	55,700
2750	9,400 to	11,300	6500	55,700 to	60,200
3000	11,300 to	13,400	6750	60,200 to	64,800
3250	13,400 to	15,600	7000	64,800 to	69,600
3500	15,600 to	18,000	7250	69,600 to	74,600
3750	18,000 to	20,600	7500	74,600 to	79,800
4000	20,600 to	23,300	7750	79,800 to	85,100
			8000		

Factor 1.0

Type 3 construction to include: Protected wood roof/floors 1 hr. with exterior block walls  
 ISO Class 2 Unprotected non-combustible-exposed wood with block walls

GPM	Square Footage of Building		GPM	Square Footage of Building	
500	less than	1,200	4250	52,501 to	59,100
750	1,200 to	2,400	4500	59,100 to	66,000
1000	2,400 to	3,900	4750	66,000 to	73,300
1250	3,900 to	5,800	5000	73,300 to	81,100
1500	5,800 to	8,200	5250	81,100 to	89,200
1750	8,200 to	10,900	5500	89,200 to	97,700
2000	10,900 to	13,900	5750	97,700 to	106,500
2250	13,900 to	17,400	6000	106,500 to	115,800
2500	17,400 to	21,300	6250	115,800 to	125,500
2750	21,300 to	25,500	6500	125,500 to	135,500
3000	25,500 to	30,100	6750	135,500 to	145,800
3250	30,100 to	35,200	7000	145,800 to	156,700
3500	35,200 to	40,600	7250	156,700 to	167,900
3750	40,600 to	46,400	7500	167,900 to	179,400
4000	46,400 to	52,500	7750	179,400 to	191,400

Augusta County Fire Flow required by ISO for Commerical, Business and Multi-Family Buildings

Factor 0.8

Type 2 construction to include: Concrete or protected steel throughout (1 hr.)

ISO Class 3 & 4 Unprotected non-combustible - exposed steel throughout

<b>GPM</b>	<b>Square Footage of Building</b>		<b>GPM</b>	<b>Square Footage of Building</b>	
500	less than	1,900	4250	82,100 to	92,400
750	1,900 to	3,700	4500	92,400 to	103,100
1000	3,700 to	6,100	4750	103,100 to	114,600
1250	6,100 to	9,100	5000	114,600 to	126,700
1500	9,100 to	12,700	5250	126,700 to	139,400
1750	12,700 to	17,000	5500	139,400 to	152,700
2000	17,000 to	21,800	5750	152,700 to	166,500
2250	21,800 to	27,200			
2500	27,200 to	33,200			
2750	33,200 to	39,700			
3000	39,700 to	47,100			
3250	47,100 to	54,900			
3500	54,900 to	63,400			
3750	63,400 to	72,400			
4000	72,400 to	82,100			

Factor 0.6

Type 1 construction to include: Concrete or protected steel throughout (2 hrs.)

ISO Class 5 & 6 Protected wood - fire resistant covering (2 hrs.)

<b>GPM</b>	<b>Square Footage of Building</b>		<b>GPM</b>	<b>Square Footage of Building</b>	
500	less than	3,300	4250 to 4500	145,900 to	164,200
750	3,300 to	6,600	4500 to 4750	164,200 to	183,400
1000	6,600 to	10,900	4750 to 5000	183,400 to	203,700
1250	10,900 to	16,200	5000 to 5250	203,700 to	225,200
1500	16,200 to	22,700	5250 to 5500	225,200 to	247,700
1750	22,700 to	30,200	5500 to 5750	247,700 to	271,200
2000	30,200 to	38,700	5750 to 6000	271,200 to	295,900
2250	38,700 to	48,300			
2500	48,300 to	59,000			
2750	59,000 to	70,900			
3000	70,900 to	83,900			
3250	83,900 to	97,700			
3500	97,700 to	112,700			
3750	112,710 to	128,700			
4000	128,700 to	145,900			

Single Family Dwellings

Augusta County Fire Flow required by ISO for Commerical, Business and Multi-Family Buildings

Dwelling units not exceeding two stories in height

<b>Distance between units</b>	<b>Needed fire flow (gpm)</b>
100 feet and over	500
31 to 100 feet	750
11 to 30 feet	1000
10 or less	1500

Other habitational buildings, up to 3500 gpm maximum.

Note:

1. Needed fire flow shall not exceed 12,000 gpm nor be less than 500 gpm.
2. Needed fire flow shall be rounded off to the nearest 250 gpm if less than 2500 gpm and to the nearest 500 gpm if greater than 2500 gpm.
3. When wood shingle roof covering is being considered or on exposed buildings can contribute to the spreading fire, add 500 gpm to the needed fire flow.

**NOTE: Exact fire flow for structures with square footages between ranges can be determined by dividing 250 gpm by square footage and then times actual square footage of building.**