



# Stafford County Fire and Rescue Department Office of the Fire Marshal

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Guidelines and Specifications for:

## Fire Flow

### Applicable Codes and Standards:

- VSFPC – Virginia Statewide Fire Prevention Code (2006)
- IFC – International Fire Code (2006) Appendix B
- SCWSS – Stafford County Water and Sewer Standards
- SCC – Stafford County Code

| Minimum Requirements  | Code Section                             |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
|---|--|--|--|--------------------------------------|--|--|--------------------|-----------|-----------|-----------------|-----------|-----------|----------------|-----------|-----------|---|--|-----------|---|--|--|---------------|--|-----------|----------------|--|-----------|-----------------|--|--|--|--|-----------|--|--|--|--|--|-----------|--|--|--|--|--|-----------|------------------------------------|
| <p>All new buildings served by public water must have adequate capacity to be capable of delivering not less than the following fire flows at 20 psi:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Distance Between Buildings</th> <th style="text-align: left; border-bottom: 1px solid black;">Single Hydrant to Meet Flow Requirements</th> <th style="text-align: left; border-bottom: 1px solid black;">Two Hydrants Within Five Hundred Feet of Structure to Meet Flow Requirements</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>One and Two Family Dwellings:</b></td> </tr> <tr> <td>31 Ft. and greater</td> <td>1,000 GPM</td> <td>1,000 GPM</td> </tr> <tr> <td>11 Ft. - 30 Ft.</td> <td>1,000 GPM</td> <td>1,500 GPM</td> </tr> <tr> <td>10 Ft. or less</td> <td>1,500 GPM</td> <td>2,000 GPM</td> </tr> <tr> <td colspan="2"><b>Townhouses &amp; Multiple Units:</b></td> <td>2,500 GPM</td> </tr> <tr> <td colspan="3"><b>Apartments, Hotels, Motels, Offices, Hospitals, Nursing Homes:</b></td> </tr> <tr> <td colspan="2">1 - 3 Stories</td> <td>2,000 GPM</td> </tr> <tr> <td colspan="2">Over 3 Stories</td> <td>2,500 GPM</td> </tr> <tr> <td colspan="3"><b>Schools:</b></td> </tr> <tr> <td colspan="2"></td> <td>2,500 GPM</td> </tr> <tr> <td colspan="3"><b>Mercantile, Retail Stores, Shopping Center, etc.:</b></td> </tr> <tr> <td colspan="2"></td> <td>2,500 GPM</td> </tr> <tr> <td colspan="3"><b>Industrial Storage Buildings, Repair Garages, Service Stations:</b></td> </tr> <tr> <td colspan="2"></td> <td>2,500 GPM</td> </tr> </tbody> </table> <p><u>Notes:</u></p> <ol style="list-style-type: none"> <li>In areas of mixed-use development, the higher fire flow shall govern.</li> <li>Where the size and scope of the development exceeds these requirements, additional flow shall be provided in accordance with ISO (Insurance Services Office) requirements.</li> </ol> <p>The available water storage system shall have adequate capacity to sustain required fire flows for a minimum of three (3) hours.</p> <p>Minimum fire flows must be available from the most hydraulically remote fire hydrant serving the building or facility being protected. Fire flows should be in addition to the daily domestic or commercial water supply demand.</p> | Distance Between Buildings               | Single Hydrant to Meet Flow Requirements                                     | Two Hydrants Within Five Hundred Feet of Structure to Meet Flow Requirements | <b>One and Two Family Dwellings:</b> |  |  | 31 Ft. and greater | 1,000 GPM | 1,000 GPM | 11 Ft. - 30 Ft. | 1,000 GPM | 1,500 GPM | 10 Ft. or less | 1,500 GPM | 2,000 GPM | <b>Townhouses &amp; Multiple Units:</b> |  | 2,500 GPM | <b>Apartments, Hotels, Motels, Offices, Hospitals, Nursing Homes:</b> |  |  | 1 - 3 Stories |  | 2,000 GPM | Over 3 Stories |  | 2,500 GPM | <b>Schools:</b> |  |  |  |  | 2,500 GPM | <b>Mercantile, Retail Stores, Shopping Center, etc.:</b> |  |  |  |  | 2,500 GPM | <b>Industrial Storage Buildings, Repair Garages, Service Stations:</b> |  |  |  |  | 2,500 GPM | <p>VSFPC 508.3<br/>SCWSS 2.1.5</p> |
| Distance Between Buildings  | Single Hydrant to Meet Flow Requirements | Two Hydrants Within Five Hundred Feet of Structure to Meet Flow Requirements |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>One and Two Family Dwellings:</b>  |  |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| 31 Ft. and greater  | 1,000 GPM                                | 1,000 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| 11 Ft. - 30 Ft.   | 1,000 GPM                                | 1,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| 10 Ft. or less  | 1,500 GPM                                | 2,000 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>Townhouses &amp; Multiple Units:</b>   |  | 2,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>Apartments, Hotels, Motels, Offices, Hospitals, Nursing Homes:</b>   |  |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| 1 - 3 Stories   |  | 2,000 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| Over 3 Stories  |  | 2,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>Schools:</b>   |  |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
|   |  | 2,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>Mercantile, Retail Stores, Shopping Center, etc.:</b>  |  |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
|   |  | 2,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <b>Industrial Storage Buildings, Repair Garages, Service Stations:</b>  |  |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
|   |  | 2,500 GPM  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <p>Where the source of supply can not deliver the minimum fire flow at 20 psi, Appendix B of the IFC (based on the ISO Fire Flow Formula) may be consulted where approved. Otherwise, the developer must provide building sprinklers and fire resistive construction.</p>   | <p>SCWSS 2.1.5<br/>IFC B105</p>          |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <p>Where a public water supply is not provided and adequate bodies of water are not available, consideration should be given to NFPA 1142 and the installation of a water storage tank or other rural water supply solution for fire protection.</p>  | <p>VSFPC 508.1<br/>IFC B103.3</p>        |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |
| <p>Accessible dry hydrants are required to be provided where a subdivision serves 5 or more lots and contains a body of water with at least 3,000 cubic feet of storage space and a public water supply is not available. Additional dry hydrants may be required for larger bodies of water. See NFPA 1142 for dry hydrant design details.</p>   | <p>SCC 22-118</p>                        |  |  |                                      |  |  |                    |           |           |                 |           |           |                |           |           |   |  |           |   |  |  |               |  |           |                |  |           |                 |  |  |  |  |           |  |  |  |  |  |           |  |  |  |  |  |           |                                    |