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FRWA WHITEPAPER

Fire Protection in Public Water Systems

Fire protection is OPTIONAL for water systems. Generally speaking the Florida Department of Environmental Protection (FDEP) does NOT mandate systems to provide fire protection, as this issue is not a water quality issue, but it gets involved with the system components as they are related to water quality, capacity and supply.

Public water supplies, which provide fire protection, shall have finished water storage tanks, reservoirs and other facilities with sufficient capacity to provide minimum design needed fire flow for the length of fire duration and shall provide adequate storage to meet diurnal peak flow with fire flow being considered. Counties can impose fire flow requirements, but they and the customers must understand the cost issues related to the additional storage, piping and pump needed. These costs are reflected in the customer rates and connection charges paid by builders and developers.

See FDEP regulations referenced which clearly indicate that fire protection is OPTIONAL:

- 62-555.315(3) Capacity of Water Supply Wells;
- 62-555.320(6) Capacity of Drinking Water Source and Treatment Facilities;
- 62-555.320(15)(a) 1. High-Service or Booster Pump Sizing; and
- 62-555.320(19) Finished-Drinking-Water Storage Capacity.

FDEP references certain standards per 62-555.330(3) – NONE of these require fire protection. Recommended Standards for Water Works, 1997 Edition, Great Lakes – Upper Mississippi River Board of State Public Health and Environmental Managers [also known as the Ten States Standards]. Paragraph 8.2.3 states,

“When fire protection is to be provided, system design should be such that flows and facilities are in accordance with the requirements of the state Insurance Services Office.”

Florida does not have an “Insurance Services Office,” see www.iso.org. ISO is not a regulatory agency, it is an insurance risk assessment organization for rating community fire insurance rates. ISO rates communities on a risk based scale of 1 to 9 according to ability to handle fire. Communities are not required to adopt ISO standards by EPA or FDEP.

American Water Works Association’s Manual of Water Supply Practices - M31 Distribution System Requirements for Fire Protection, page 2 states:

“The decision of whether or not to size distribution system components, including water lines, appurtenances, and storage facilities, for fire protection must be made by the governing body of the community. This decision is made in conjunction with the water utility if the utility is privately owned. However, there is no legal requirement that a governing body must size its water distribution system to provide fire protection. In some instances this undertaking may be prohibitively expensive. For privately owned

utilities, the distribution system would not be sized for fire protection unless such an undertaking could be shown to be commercially profitable.

“The governing bodies of most communities do provide water for fire protection for a variety of reasons, including protection of the tax base from destruction by fire, preservation of jobs that would be lost in the event of a large fire, preservation of human life, and reduction of human suffering.

“When a community’s governing body provides fire protection, it must do so in accordance with a well-thought-out plan that will provide adequate supplies for the intended purpose. An inadequate fire protection system provides a false sense of security and is potentially more dangerous than no system at all”.

If a water system decides it is not providing fire protection, it should clearly state this fact to its customers and in its literature. Any substandard fire hydrants should be painted, bagged, or marked to indicate that the system is not able to deliver fire protection flows at those locations.

Grant / Loan Funding is NOT available for Fire Protection Improvements. Florida State Revolving Fund (SRF) and USDA Rural Development funds are expressly prohibited to expressly fund fire protection improvements. Projects that primarily expand system capacity or enhance fire protection capabilities may not be eligible for funding unless public health or compliance issues also are addressed by the project.

Insurance Services Office – Fire Suppression Rating Schedule provides a detailed approach to review and rate the available fire suppression facilities. Needed fire flow equations are provided for individual buildings based on size, floors, construction materials, contents, use, and is the buildings are closely spaced together. The smallest fire flow value recognized by ISO is 500 gpm and the system must maintain a 20 psi minimum pressure residual. These standards are also found in American Water Works Association (AWWA) manual M31 *Distribution System Requirements for Fire Protection*. Several elements that you should be aware of are:

FIRE FLOW DURATIONS
(from AWWA M31, page 12, Table 1-1)

Required Fire Flow (gpm)	Duration (hours)
2,500 or less gpm	2 hours
3,000 to 3,500 gpm	3 hours

Fire flow 4,000 gpm and greater requires a 4-hour duration to determine storage requirements.

NEEDED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS*
(from AWWA M31, page 18, Table 1-5)

Distance between Buildings (feet)	Needed Fire Flow (gpm)
More than 100 feet	500 gpm
31–100 feet	750 gpm
11–30 feet	1,000 gpm
Less than 11 feet	1,500 gpm

* Dwellings not to exceed two stories in height.

Fire Hydrant Color Schemes. American Water Works Association’s Manual M17 Installation, Field Testing, and Maintenance of Fire Hydrants, page 25 states:

“The adoption of a color scheme to indicate flow capacity is optional. However, if such a scheme is to be used, the uniform color coding system shown in Table 4-1 is recommended. According to this system, hydrant tops and caps are painted to indicate the hydrant’s expected flow rate. This color scheme is consistent with NFPA 291, Fire Flow Testing and Marking of Hydrants.”*

**Table 4-1
Color Scheme to Indicate Flow Capacity**

Flow gpm at 20 psig ¹	Color
greater than 1000 gpm	Green
500 – 1000 gpm	Orange
Less than 500 gpm ²	Red ²

Notes:

- This is the calculated flow at a calculated residual of 20 psi and with the actual residual on an adjacent nonflowing hydrant being 40 psi or greater. When the actual observed residual on the adjacent nonflowing hydrant is less than 40 psi, the color scheme should be based on one half of the observed flow. An alternative scheme for color coding may be related to the size of the water main supplying the hydrant.*
- Water systems wishing to designate non-hydrants (for bypass, flushing or blow off) have used BLACK paint so fire professionals or public does not confuse them with functioning fire hydrants.

Additional comments in AWWA Manual M17 are below:

“While the exact responsibilities of the water utility and the fire department may vary widely from one location to another, it is important for the two groups to clearly understand each other’s role in hydrant maintenance and other issues. Good communication between water officials and fire officials is important not only for hydrant maintenance but in all areas of mutual concern. For example, the water utility should communicate to the fire department information about which hydrants can provide high flows and which ones are marginal by color coding hydrants or by providing maps of the distribution system.”

“Hydrants must be highly visible and unobstructed at all times. Therefore, whether or not a color code is used, hydrants should be painted with colors that are easily visible both day and night.”