Coffee Break Training - Fire Protection Series

Access and Water Supplies: Water Main Inline Strainers

No. FP-2012-51 December 18, 2012

Learning Objective: *The student shall be able to indicate functional limits and correct installation of inline strainers for fire protection water mains.*

Where fire protection systems such as sprinklers or water spray take their supplies from static or otherwise open sources (such as penstocks, flumes, rivers, lakes or reservoirs), the intake should be protected by some sort of filtration system. Filtering means can be provided with an approved, double, removable screen or an approved strainer, as shown in the illustration, known as a "Y" strainer. The strainer is the large "can-like" assembly at the left of the picture.

This inline strainer assembly is intended to protect a fire pump from damaging debris.

Like many attachments, strainers can affect the incoming water pressure, and their influence should be considered in the fire protection systems' hydraulic calculations. The amount of pressure lost is determined by the size of the strainer; the values can be obtained from the product manufacturer. One manufacturer's product includes the following pressure-drop values for its various size strainer assemblies.

Strainer Size		Pressure Drop*	
Inches	mm	Psi	Bar
3	76.2	3.27	0.225
4	102	3.18	0.219
6	152	3.59	0.246
8	203	3.08	0.212
10	254	3.29	0.226
12	305	2.79	0.192

*Based on flow rates of 15 feet (5m) per second.

Another important consideration is the proper installation of the strainer assembly. In the illustration, the strainer orientation is correct (removable cover at the bottom). The ductile iron pipe at the lower right of the picture is the intake from a storage pond, and water is drawn from the pond through the strainer before reaching the fire pump assembly. A review of the manufacturer's installation instructions show that the flow direction should be from the top through the strainer intake in this orientation. The manufacturer also permits a horizontal installation with the removable cover nearest the floor. The strainer housing is marked with an arrow to show the correct direction of flow. (See Coffee Break Training FP2012-33 for a discussion on directional arrows for valves and 2007-17 for the importance of straight pipe installations upstream of a pump intake.)

Mainline strainers should be inspected and cleaned after each system flow exceeding that of a nominal 2-inch (50-mm) orifice and should be removed and inspected annually for failing, damaged and corroded parts, with the necessary corrective action taken. If parts of the strainer assembly are plugged or otherwise fouled, they should be replaced or repaired.