

Cross Talk

Autumn 2011

Today, various building codes are requiring residential fire sprinkler systems to be installed in all new residential construction. Installing a fire sprinkler system brings up questions regarding appropriate backflow

Chapter Three of the *Tenth Edition of the Manual of Cross-Connection Control* discusses "Three Questions" used to determine which type of backflow prevention assembly is needed in specific situations.

Residential Fire Sprinkler Systems



and Backflow Protection

protection at the location. Even though installing fire sprinkler systems in residential construction is new in some areas, determining the backflow protection needed for a fire sprinkler system is the same; be it for a factory or a family residence.

As with any water use, the level of protection must be commensurate with the degree of hazard.

The questions are as follows:

Is the connection a direct or indirect cross-connection?

Is the cross-connection to a pollutant (non-health hazard) or a contaminant (health hazard)?

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Foundation

Membership

The Foundation's Membership Program provides many benefits to the Members of the Foundation. These include: a twenty-five percent discount on manuals, twenty percent discount on Foundation Training Courses for any employee of the Member company/organization, the *List of Approved Backflow Prevention Assemblies* with access to the up-to-the-minute version on the Foundation's website.

Members are encouraged to call the Foundation with technical questions. The Foundation's Engineering Staff is available to assist Members with the various aspects of field testing backflow preventers, installing backflow preventers and administering their cross-connection control program.

Below is a list of those who have become members of the Foundation since the last Cross Talk:

AAA Precision Backflow, LLC	JW Fire Sprinkler Design
Aaron Old	Lynwood City Hall
ABPA- Central Coast Chapter	Nibco
Accurate Backflow Services	Peterson Plumbing Co.
Anmac Service Company	Pipeman Plumbing
Capstone Mechanical	Pride Industries
Clean Water Services	Serian Company, Inc.
Costich Engineering	Seward, City of - Public Works Dept.
Cuesta College	Steve Chew
Florida Section AWWA	Thomas Plumbing Company
Garden Grove, City of	UC Davis WSREC
High Tech Construction & Fire Protection	Val-Matic Corp.
Hollister, City of	Washington Suburban Sanitary Commission
Joe Green Plumbing	Williams, City of

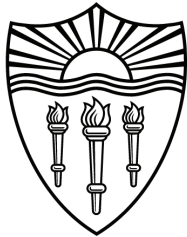
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New **USC Graphic Identity** Program

In the coming months Foundation members will notice a new logo for the University of Southern California. Beginning on November 1, USC began a rollout of its new graphic identity program designed to reflect USC's position as a premier institution in education.

The new graphic identity program consists of a new USC logo, monogram and typefaces. The shield, which has been part of the University Seal since 1908, twenty-eight years after the University's founding in 1880, is a major part of the new identity.



USC University of Southern California

The shield bears a setting sun and three torches. The sun signifies the West and, according to tradition, power and life. The three torches represent learning in the arts, sciences and philosophy. The shield will be featured prominently throughout USC's new graphic identity program.

Introducing a new logo will help USC maintain a consistent look throughout all different schools and departments names within the University.

Over the next year USC will be phasing in the new identity program. The new logo will be featured in the new Field Testing Backflow Preventers Instructional Video coming out at the beginning of 2012. Foundation Members may still see some of the elements from the previous identity program until the phasing in of the new system is final. ■



The **Foundation** and **Social Media**

The USC Foundation recently set up a Facebook and Twitter account. The past couple of years has seen social media, like Facebook, skyrocket in the number of users and in the process has created a new means of communication.

The Foundation will use social media tools, like Facebook, as another means of communicating information with its members. Information regarding *List* updates, *Cross Talk* topics, course dates and much more will be posted. Bear in mind, the Foundation will continue updating its website (fccchr.usc.edu) and notifying members of any changes to the List via e-mail. **A member's e-mail contact will continue to be the Foundation's primary form of contact regarding any List updates.**

All members are encourage to follow the Foundation on Facebook, Twitter and the website for news on the upcoming release of the new Field Testing Backflow Preventers Instructional Video being released early next year. All information regarding the Foundation's social media contact may be found on the back page of *Cross Talk*. ■

Winterizing and Shutoff Valves

With winter fast approaching many will be winterizing portions of their water systems. Winterizing involves the water being drained out of the water line prior to the winter months to prevent pipes from bursting. This type of damage may be found on water pipes and backflow prevention assemblies. A number of approved backflow prevention assemblies use fully ported ball valves in their assemblies that may increase the likelihood of damage due to freezing on those shutoff valves during the winter months unless proper precautions are taken.



The use of resilient seated shutoff valves in approved backflow prevention assemblies has significantly improved the field-testing of the assemblies. Having a tight shutoff valve has made the job of the field tester considerably easier. Most manufacturers of the 2" and the smaller variety have selected to use fully ported ball valves as their type of resilient seated shutoff valves.



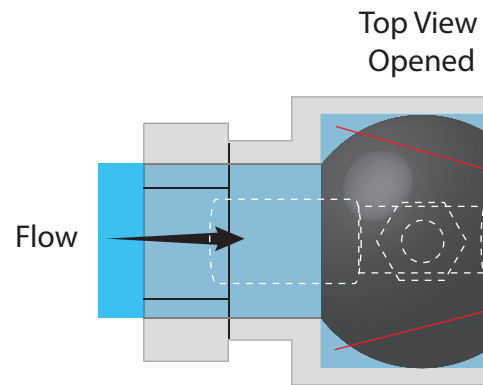
These valves have shown themselves to be effective due to the flow characteristics and its effective shut off capabilities. However, they have shown to be damaged during the colder

months unless precautions are taken to prevent damage due to freezing.

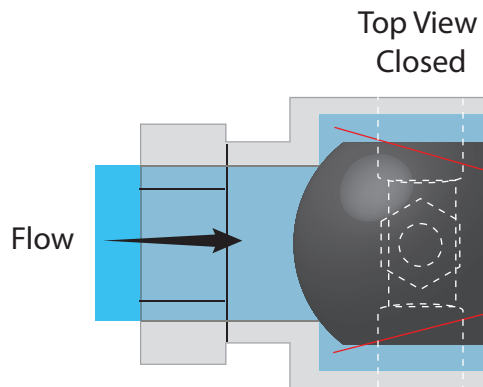
When water freezes it occupies a 9% greater volume than in its liquid form. The ice causes pressure to build inside the pipes that can cause them to burst and may cause permanent damage in shutoff valves that are a part of backflow prevention assemblies. Winterizing a water system helps but it may not completely eliminate the possibility of the shutoff valves being damaged during the colder months.

Even with the winterizing of a water line, the ball valves may be left in the fully opened or fully closed position. When this is done there may be a small volume of water trapped between the outside of the ball and the body. With this trapped volume of water freezing, the resulting damage can be significant. Seals or components may be distorted and in extreme cases the body housing itself could be cracked. As seen in the figure, with the valve in the opened or closed position, the small pocket of water is trapped in place.

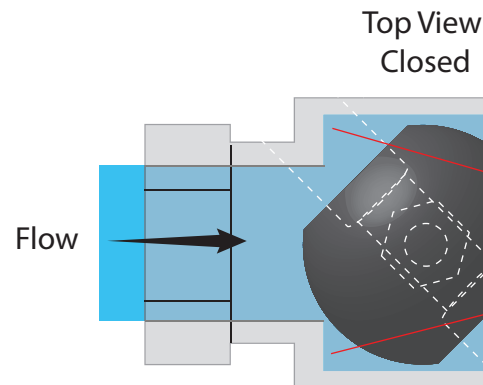
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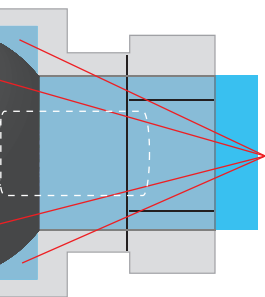
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A valve left at a 45-degree angle will all result reducing

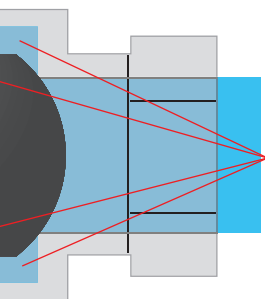


Water would collect if a valve is left open.



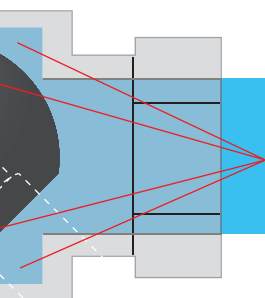
Trapped Water

Water would collect if a valve is left closed.



Trapped Water

Allow water to escape from the pockets as a risk of damage.



Water Escapes

Where winterizing of a water line is necessary, it is highly recommended that the ball valve be left in a partially opened position. Leaving the valve at a 45-degree angle will leave this pocket unsealed and the trapping of water will be significantly reduced, thus eliminating any damage to the valve.

Ideally, backflow preventers used in environments with freezing temperatures should be kept in an area (i.e., building, basement) protected from the harsh environment. However, this is not always possible or practical. For those backflow prevention assemblies that are on water lines that must operate during winter months; enclosures can be used to protect the assemblies from freezing. Enclosures may generally be separated into two categories; freeze retardant enclosures (i.e., non-heated) and freeze protection enclosures (i.e., heated). However, the above-mentioned suggestions may not always be available and therefore in those cases it is important to leave the ball valves in the partially open position in order to minimize the potential for trapping water in the ball valve and that should help prevent freeze damage to ball valves. ■

Orientation of Assemblies



The USC Foundation's policy is that assemblies are approved for installation in the orientation under which they were evaluated only. Installing an assembly in any other orientation other than the orientation(s) listed on the *List of Approved Backflow Prevention Assemblies* will invalidate the USC Foundation's Approval. Depending upon the type of assembly, there are several orientation possibilities.

Some have commented that the USC Foundation does not approve assemblies in certain orientations. On the contrary, the USC Foundation will approve an assembly in any orientation as long as the manufacturer requests it and the assembly successfully completes both the laboratory and field evaluation.

Please refer to the *List* for orientation information along and orientation key attached to the *List*. ■

fire sprinkler systems: continued

continued from **page 1**

Is the connection under continuous use or pressure (used for more than twelve of any twenty-four hours)?

By answering these three questions and referencing the chart on page 58 of the *Tenth Edition* one can determine which type of backflow prevention assembly is required for backflow protection.

The chart is shown here.

TYPES OF BACKFLOW PROTECTION

	Indirect Backsiphonage Only		Direct Backsiphonage & Backpressure
	Continuous Use	Non-Continuous Use	
Health Hazard (Contaminant)	PVB/SVB RP AIR GAP	AVB PVB/SVB RP AIR GAP	RP AIR GAP
Non-Health Hazard (Pollutant)	PVB/SVB RP DC AIR GAP	AVB PVB/SVB DC RP AIR GAP	DC RP AIR GAP

Applying the three questions above, the following is discovered.

Is the connection a direct cross-connection (subject to back pressure) or is it an indirect cross-connection?

Any fire sprinkler system will be considered a direct cross-connection because sprinkler

systems may create a backpressure condition due to elevation, thermal expansion etc.

Jumping ahead to question three *Is the connection under continuous use or pressure (used for more than twelve of any twenty-four hours)?*

The systems are considered under continuous pressure.

And, finally question number two *Is the cross-connection to a pollutant or contaminant?*

This isn't always a simple question. In situations where there are additives in the sprinkler system, such as fire fighting foams for fighting chemical fires, or anti-freeze to prevent freezing, the degree of hazard will be considered a health hazard. But there is another condition to consider.

In fire sprinkler systems there is often a problem because of water sitting stagnant in the pipeline for a period of time. The Water Research Foundation (formerly the American Water Works Association Research Foundation) sponsored a study (90752) in 1998 testing the quality of water in wet-pipe fire sprinkler systems. This study found that water quality exceeded secondary standards for iron, manganese, TDS, color and odor; as well as the primary standards for lead and cadmium. This is the piping used in most fire sprinkler systems and is not considered potable piping material for the obvious reasons. Some agencies have required reduced pressure principle assemblies on all black iron piping systems because of this report.

If the piping is considered potable piping, the problem of the stagnant water is still an issue. In these cases, however, the degree of hazard would be considered a pollutant, or non-

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health hazard. A pollutant is considered something that is aesthetically objectionable. It may smell, look and/or taste bad but ingestion will not cause illness or death.

In some cases residential fire sprinkler systems are using potable water piping on a flow-through system. This means the water that is being used in the residence flows through the fire sprinkler system to get to the various points of water use. In this way the water

never becomes stagnant in the pipes but is constantly being refreshed when any water is being used. In these situations there is no degree of hazard and no backflow protection would be needed. ■

Frequently Request Documents

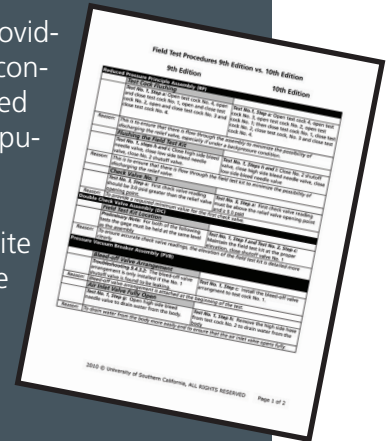
The USC Foundation's website (fccchr.usc.edu) is a valuable resource for members; providing training tools, courses and information regarding backflow prevention and cross-connection control. One of the many features of the site includes a "Frequently Requested Documents" page that makes available information regarding several of the more popular subjects the Foundation receives questions about on a daily basis.

The page may be found below the 'Information' pane on the USC Foundation's website home page (<http://www.usc.edu/dept/fccchr/frd.html>). There, members can find some of the more important documents pertaining to backflow training and cross-connection control.

Currently, members may find a worksheet entitled '*Field Test Procedures 9th Edition vs. 10th Edition*,' that lists the differences between the field test procedures found in both editions of the manual side-by-side. With the release of the *Tenth Edition* two years ago many members were confused on the changes and what the reasons were for the change. The worksheet outlines the four backflow prevention assemblies (RP, DC, PVB, SVB) and lists the reasons for the change in the *Tenth Edition*.

Another frequently requested document found on the page is entitled 'Protection for Post Mix Carbonators,' which address the common questions regarding the level of backflow protection needed on post mix soft drink carbonators.

Other documents found on the "Frequently Requested Documents" page includes; *Prevalence of Cross-Connections in Household Plumbing Systems, Gages and Manufactures* and *Hosting Course Information*. The Foundation strongly recommends all members take a few minutes to look through some of the documents found on the "Frequently Requested Documents" page. ■



Training Courses

Tester Course

Los Angeles, CA
9-13 January 2012

Specialist Course

Los Angeles, CA
23-27 January 2012

Upcoming Events

TREEO Center
Annual Cross-Connection Control
Conference
Daytona Beach, FL
7-8 March 2012

CA/NV AWWA
Spring 2012 Conference
Santa Clara, CA
2-5 April 2012

ABPA Annual Education Conference
& Trade Show
Reno, Nevada
30 April - 2 May 2012

Social Media

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