

Testing a Vertical Double Check

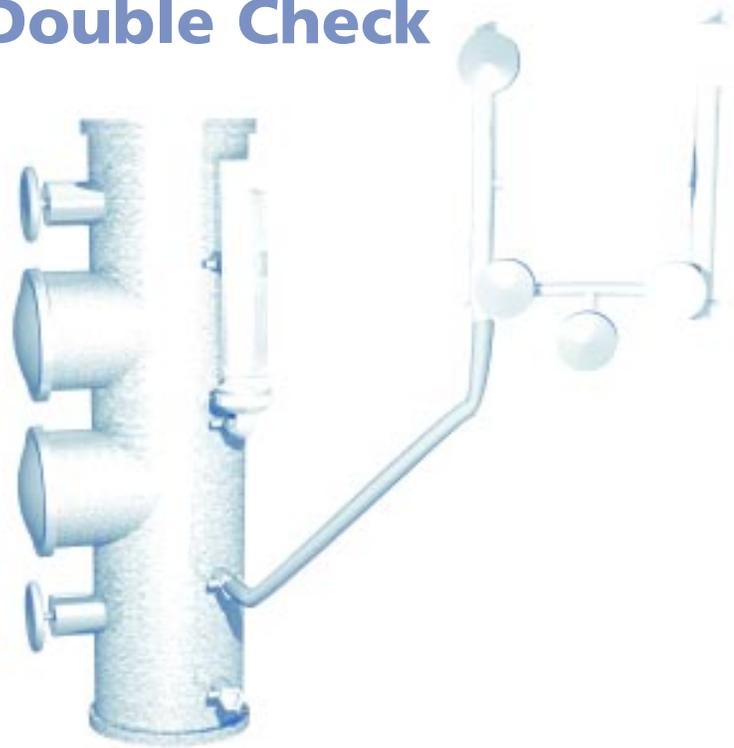
Many double check valve assemblies and double check detector assemblies have been approved in the last year or so in the vertical orientation (flowing upward). Because of this, the question of how to test the double check valve assembly in the vertical orientation has arisen. The ninth edition of the *Manual of Cross-Connection Control*, contains illustrated field test procedures for testing the double

To record the correct differential pressure reading the gage must be held at the same elevation as the test cock on the downstream side of the check valve being tested.

check valve assembly. Although the procedures show the assemblies in the horizontal orientation, the field test procedure is essentially the same for an assembly installed in the vertical orientation. The most commonly asked questions regarding field testing the double check in the vertical orientation are:

How high should the sight tube be? and At what level should I hold the gage?

The Manual in Section 9.3.3.1 states



Testing the first check valve of a vertically installed double check valve assembly, the sight tube should extend to an elevation above the number four test cock.

During this test it is important to keep the gage equipment and unused hoses at the appropriate elevation. A solid downstream reference point is needed for this test. If the downstream test cock is at the highest point of the body, then this can be used as the reference point. However, if the downstream test cock is below the top of the body, then a piece of pipe or tubing must be attached to the downstream test cock so that it rises above the top of the body.

To record the correct differential pressure reading the gage

Continued on page 3

Highlights

- **Membership Survey**
- **PVB's with a Leaking No. 2 Shutoff Valve**
- **Complaints**
- **Testing Vertical Double Checks**

NEW FOUNDATION Members

The Foundation Staff would like to welcome the following new Members to the Membership Program. Remember all Members are welcome to contact the Foundation Office with any questions regarding cross-connection control. Also, Members are granted discounts on Courses, Manuals and Training Tools. We trust your Foundation Membership will be a great benefit to you in your cross-connection control efforts.

Bac-Flo Unlimited

Bailey's Backflow/Cross
Connection

Bob & Marc Plumbing

BSW International

Colonial Plumbing
Service

Consolidated Mutual
Water Company

City of Imperial

Desert Fire Protection,
Inc.

Edward E. Embly

G & M Plumbing

Grauco

Jack B. Henderson
Const. Co., Inc.

State of Montana

Northside Plumbing

San Francisco Water
Dept.

SoCAL Plumbing &
Mechanical, Inc.

Steamboat Springs

Water

Welker & Associates Inc.

Western Pipe & Supply

Cross Talk is published by the University of Southern California's Foundation for Cross-Connection Control and Hydraulic Research for its Members. Additional Copies are available to the Members upon request. (213) 740-2032 Copyright 1996 © University of Southern California. All rights reserved.

Printed
on
Recycled Paper

The Foundation for Cross-Connection Control and Hydraulic Research
University of Southern California
Kaprielian Hall 200
Los Angeles, CA 90089-2531

Phone: (213) 740-2032

FAX: (213) 740-8399

E-Mail: fccchr@usc.edu

WWW Homepage:

<http://www.usc.edu/dept/fccchr/>

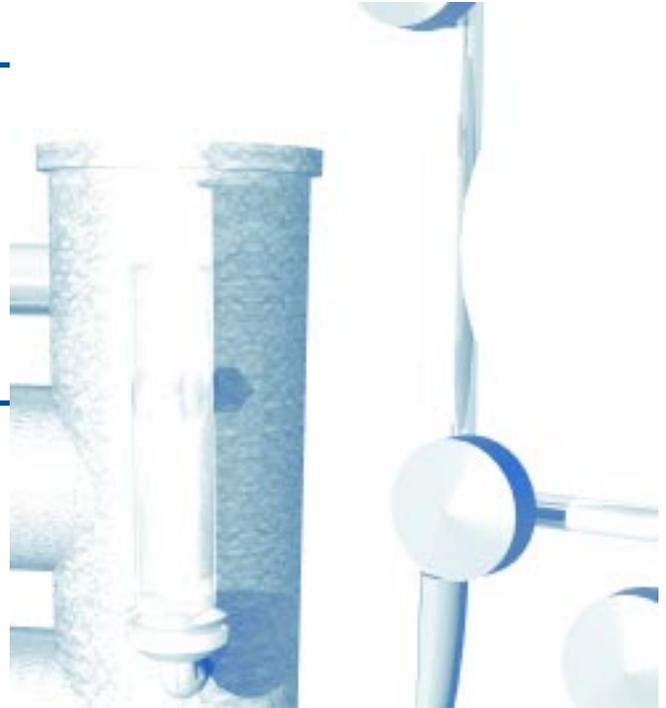
Testing the Vertical Double Check

Continued from page 1

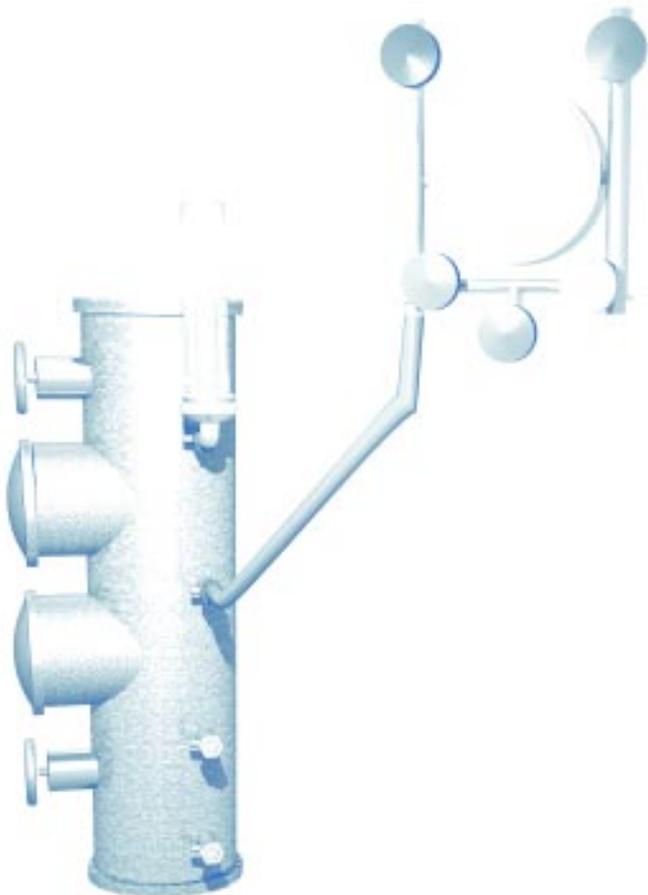
must be held at the same elevation as the test cock on the downstream side of the check valve being tested. If a tube is attached to the downstream test cock, then the gage must be maintained at the same height as the water in the tube. If this is not done properly, then values which are either too high or too low may be recorded.

Following these instructions while testing the assembly vertically will produce correct

If the gage is not held at the same level as the water in the site tube erroneous readings may be recorded



The centerline of the gage should be level with the water level in the tube, not with the top of the tube.



Testing the second check valve of the vertical double check valve assemblies requires the tester to have the sight tube higher than the downstream shutoff valve.

results. However, with some of the assemblies this may require a cumbersome length of tubing when testing the first check of a double check with the flow vertically upward. The tube, in order to get to the highest point of the body would need to reach a point above the downstream shutoff valve.

However, while testing the first check valve it is only necessary for the tube to be extended above the highest portion of the region between the check valves. If it is difficult to determine where this is, the tester should simply make sure the tube extends to the elevation of the Number four test cock. This will assure that the tube is above the highest point between the check valves.

In some cases the tester will need a longer sight tube than used in testing horizontal assemblies to obtain a good reference point. As with testing the double check valve assemblies in the horizontal orientation, it is important for the tester to hold

Continued on page 5

Complaints About an Assembly? ...Let us Know

Backflow prevention assemblies Approved by the Foundation are Approved for a period of three years. One of the main considerations the Foundation uses for renewals, is the complaints received from the Members. As an assembly is scheduled for renewal, the Foundation staff determines if there are any unresolved complaints. If there are unresolved complaints, the Foundation may withhold the renewal or rescind the Approval of the assembly in question. The Foundation Staff uses the comments from the Members to know what is happening in the field with assemblies which have already been Approved.

As renewals are considered the Foundation Staff needs to know what problems the Membership has experienced with specific assemblies. If the problems appear to be universal and not specific to the water system, or a problem with the testing method, an investigation will be launched.

The first step in the Foundation's investigation is to determine if the same problem reported is occurring at other locations. The Foundation field staff first inspects units in operation in field locations in close proximity to the Laboratory. If there seems to be a parts or materials problem, components are independently secured and inspected to determine if, in fact, there is a difference in material, design, or tolerances from the assembly as it was originally

Approved. A sample would also be requested from the manufacturer to carry out a spot evaluation. Field test data from various administrative authorities will be requested to corroborate the information received in the initial complaint. Once these steps are complete, the Foundation will have either shown that the problem was localized and not a widespread problem with the design of the assembly; or, the Foundation will have confirmed a problem with the operation of an Approved backflow preventer whether it be through design, material, or manufacturing changes.

Once a complaint has been investigated and the independent confirmation of a problem has been completed, the Foundation will notify the manufacturer and the originators of the complaint of the findings. (All input/complaints which the Foundation receives will be kept confidential.) Depending upon the problem, the manufacturer may be given a certain time table to correct the problem, or

the Approval may be rescinded immediately. If a change in the design is made to bring the assembly back into compliance, a notice is sent to Members listing the serial numbers of those assemblies which did not meet the specifications and are, thus, not Approved. Information on how to contact the manufacturer to correct the problem is also provided to the Membership. The information, such as a change of design, or recall of components will be discussed in a special notice sent to all Members of the Foundation as well as in *Cross Talk*.

The renewal process is a means of assuring the backflow preventers continue to operate and meet the specifications as well as they did when they were first Approved. The Membership's assistance in providing information about various problems encountered in the field is extremely important to this aspect of the Approval Program. The Foundation Engineering Staff encourages comments from the Members. ♦



*The Foundation offers an information brochure on **Water**. This is used by many Members to explain the problem in a written format. This is an ideal compliment to the film to take a written explanation away from the field and address on the brochure so that the reader can refer to the connection control program. Ordering information is available and discounted at twenty-five percent. Prices vary by quantity and the cost for 2500 is \$375.00.*

Testing the Double Check

the gage at the same level as the *water* in the sight tube. This should not be a problem if the tester is using a high pressure hose with a minimum length of six feet as stated in Section 9.3.1 of the Manual. If the gage is not held at the same level as the water in the site tube erroneous readings may be recorded as noted in the excerpt from the Manual on page one. It has been observed that some testers hold the gage level with the end of the sight tube, not the level of the water in the sight tube. When the test cock is opened

It has been observed that some testers hold the gage level with the end of the sight tube, not the level of the water in the sight tube.

to the sight tube, air bubbles may come out and displace

some of the water, causing the water level to stabilize below the end of the sight tube. The tester must carefully observe the level of the water.

While testing the second check valve, the sight tube is located on the #4 test cock and the water level should be at the elevation of the number two shutoff valve. For testing purposes, the sight tube should be at the level of the seal in the downstream shutoff valve. However, this may be difficult to determine. The tester should consider having the elevation of the end of the sight tube above the downstream side of the number two shutoff valve to assure the level of the tube extends beyond the sealing surface in the shutoff valve.



Testing the PVB

...a missing step

The *Manual of Cross-Connection Control*, Ninth Edition includes illustrated field test procedures for the pressure vacuum breaker assembly. Also included is information on troubleshooting which will help the tester determine if everything is operating properly or what is operating incorrectly.

The troubleshooting section helps the tester diagnose a leaking or low reading check valve, an air inlet valve that leaks or opens at a low value, and a leaking number one shutoff valve. One problem which could occur rather frequently but is not listed in the troubleshooting is a leaking number two shutoff valve.

How would a leaking downstream shutoff valve be detected while testing the pressure vacuum breaker? The

Continued on page 6

more information on cross-connection control entitled **Working Together for Safe Water**. This brochure explains the concepts of cross-connection control in a simple written format. Order your copy today! **Working Together for Safe Water**, as it allows those viewing the film/video to take home a copy for later perusal. The Foundation will imprint your name on the brochure. For more information on the cross-connection control brochure, contact the you directly for more information on the cross-connection control brochure. Membership prices are available from the Foundation office. Membership prices are \$15.00 per year. Order in bulk for a discount. Order on quantity ordered: 500 brochures cost \$115.00; 1000 cost \$190.00

Testing the PVB

continued from page 5

first indication of a leaking downstream shutoff valve would

How would a leaking downstream shutoff valve be detected while testing the pressure vacuum breaker?

appear just before the tester attempts to find the opening point of the air inlet valve. This would be Section 9.4.2, Test 1-f in the *Manual of Cross-Connection Control*. At this step the tester has attached the high side hose to the number two test cock, bled the gage and is holding the gage level with the centerline of the assembly. Step f calls for the tester to close the number two shutoff valve and then the number one shutoff valve. If the second shutoff valve leaks this is when the tester should notice it.

As soon as the number one shutoff valve is closed, pressure would be lost through the leaking number two shutoff valve. It is very important, at this point, for the tester to watch the reading on the gage. If the reading begins to drop after closing the number one shutoff valve, yet before step g, where the tester opens the high bleed needle valve, then there is a leaking number two shutoff valve.

Although there is a leaking number two shutoff valve, the tester can get an accurate value for the opening point of the air inlet valve if attention is given to the gage reading while closing the number one shutoff valve.

If the reading starts to drop the tester must observe the reading on the gage when the air inlet valve opens and record this value as the air inlet opening point.

With the number two shutoff valve leaking, the tester can continue the test to determine the differential across the check valve. The second test should be performed exactly the same as if the shutoff valve was holding. The tester will notice during the second test that the gage reading will begin to drop before expected. The tester has repressurized the assembly, disconnected the high side hose from the number two test cock and attached it to the number one test cock, bled the gage and closed the number one shutoff valve. At the closure of the number one shutoff valve the reading on the gage may begin to fall, if the number two shutoff valve is leaking. The tester should continue the test (with the gage at the same elevation as the number two test cock) by opening the number two test cock fully. When the flow of water stops and the reading on the gage settles, this reading is the value to be recorded for the check valve.

Testing the pressure vacuum breaker with a leaking number two shutoff valve is quite simple. The leaking number two shutoff valve actually performs parts of the test for the tester. While testing the air inlet valve, water is drained out of the body through the number two shutoff valve instead of

through the high side bleed needle valve, but the effect is the same. While testing the check valve the leaking number two shutoff valve simply speeds up the process of reducing the pressure downstream of the check valve—but the testing procedure for the check valve does not change. 💧



Credit Cards Accepted

The Foundation now accepts credit cards for payments. You can use your Visa MasterCard or Discover to pay for any of the following:

- ✓ Membership
- ✓ Training Courses
- ✓ Manuals
- ✓ Informational Brochures
- ✓ T-Shirts and Hats
- ✓ Other Training Tools

Now that the Foundation accepts credit cards orders can be handled over the telephone. To place an order or to pay your Membership fees, call the Foundation office at:

(213) 740-2032



Membership Survey

As the Members are aware, the Foundation recently surveyed the Membership of the Foundation. The survey was implemented to allow Members to give the Foundation staff their input on the various items on which the Foundation is or will be working.

One portion of the survey was directed towards the computer usage of Foundation Members. This is important for several reasons. With the Internet gaining widespread popularity as an effective tool for transferring information and communication, it was important to know if Foundation Members

Approximately seventy percent of those responding stated that they either have Internet access or are planning on obtaining access soon

have access to the Internet or plan on obtaining access in the near future. This helps us determine if the Internet should be considered as a viable means of updating the members with important information. This way we can determine how much effort should be placed into the Foundation's Internet projects and a realistic timetable can be established knowing approximately how long it will take before most Members have access to the Internet.

The response was quite surprising. Approximately seventy percent of those re-

sponding stated that they either have Internet access or are planning on obtaining access soon.

Another important computer issue was what type of computers and software are being used currently. This helps the Foundation determine if it is feasible to provide information in various electronic formats. Currently, the Adobe Acrobat™ reader has proven to be very effective for those having Internet access. Documents, including graphics and text can be downloaded, viewed and printed using Acrobat™ which is available free from Adobe.

This portion of the survey showed that over ninety-eight percent of the Foundation Members using computers use PC based computers and less than one percent use MACs. This again helps us to determine, if information can be provided in electronic format, which formats would be best. The survey indicates that there is a wide variety of software being used by the Members for various aspects of their work.

The survey also asked Members to indicate which items would be most beneficial to them in their cross-connection control efforts. The choices were:

- **Software for tracking backflow records**
- **The List of Approved Backflow Prevention Assemblies in**

alternate electronic formats for downloading

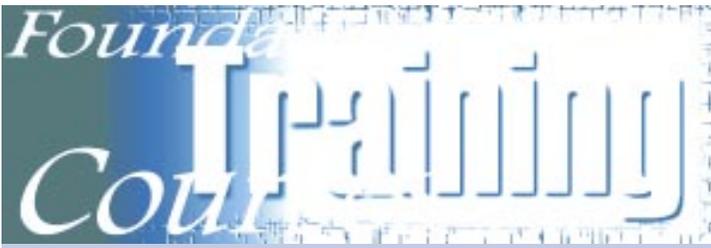
- **A video detailing the field testing procedures of the Manual of Cross-Connection Control**
- **A one-day update seminar on the field testing procedures**
- **A repair course for backflow prevention assemblies.**

Although the results have not been completely tabulated and surveys are still arriving, it

Comments and suggestions are always welcome from the Foundation members. It helps the Foundation staff focus their efforts on those items which will be most beneficial to the Members.

appears that most Members are interested in the field test procedures on video and software for tracking backflow records.

More details of the final results will be posted in the next issue of *Cross Talk*. Meanwhile, comments and suggestions are always welcome from the Foundation members. It helps the Foundation staff focus their efforts on those items which will be most beneficial to the Members. Comments may be mailed, faxed, e-mailed, or sent via the "Information Request" Page on the Web (<http://www.usc.edu/dept/fccchr/inforeq.html>). ♦



Tester Training Courses

15-19 July 1996
Los Angeles, CA

5-9 August 1996
Incline Village, NV

23-27 September 1996
Las Vegas, NV

6-10 January 1997
Las Vegas, NV

12-16 May 1997
Los Angeles, CA

Program Specialist Training Course

22-26 July 1996
Los Angeles, CA

17-17 January 1997
Los Angeles, CA

14 August 1996 - Santa Ana, CA
Joint Instrumentation Committee

16 August 1996 - Portland, ME
American Backflow Prevention Association,
Region I Conference

11 September 1996 - Riverside, CA
Inland Counties Water Association Seminar

19 September 1996 - Pasadena, CA
Southern California Water Utilities Association
Vendor's Fair

26-28 September 1996 - Laughlin, NV
Tri-State Seminar

