Received
Mar 26 2019
Cross Connection

City of Eagle Point 41-00267
Cross Connection Backflow Prevention

WRITTEN PROGRAM PLAN:

Per OAR 333-061-0070(9)(b) sections A thru H, Community water systems with 300 or more connections must have a written program plan for cross connection/backflow prevention. These plans are to include:

A. A list of all premises that have health hazard cross connections.
B. Cross Connection staff.
C. Procedures used for evaluating the degree of hazard.
D. Procedure for notifying water users after the degree of hazard is determined and what corrective action is necessary.
E. Type of protection required.
F. Penalties for not taking corrective action.
G. Records of assemblies and other data.
H. Public education program.

More information is included in the complete OAR (Oregon Administrative Rule) Chapter 333 Division 061 permanently adopted January 31, 2006. That document is attached.

A. A list of all premises that have health hazard cross connections:

(1) Car Washes: 11230 Highway 62
(2) Medical Centers: 261 Loto St.; 275 Loto St.; 217 W. Main St.; and 1350 S Shasta Ave
(3) Laboratories: 203 Platt Ave.; and 477 Reese Creek Rd.
(4) Wastewater lift stations and pumping stations: 128 Old Highway 62

B. Cross Connection Staff:

(1) Darren Kinyon, Specialist
(2) Ted Pullium, Specialist

C. Procedures used for evaluating the degree of hazard:

(1) Normally, the risk to the water system can be divided into one of two general categories:

(a) High Health Hazard:
A substance that could pose an immediate health concern because of the risk of death spread of disease or illness, or injury to the customer if it were introduced into the potable water supply. The substance could constitute a physical, biological and/or chemical hazard. The high health hazard may be considered severe if the substance could pose a high risk of death, spread of disease or illness to the customer if it were introduced into the potable water supply. Examples of a severe risk substance include pathogenic bacteria such as Cholera, or a lethal chemical such as radioactive waste.

(b) Low Health Hazard:
A substance that would not impose an immediate health concern, but could result in the water in the purveyor's system not meeting drinking water standards, or could interfere with the monitoring of water quality. Some substances do not impose a health concern, but would result in water that is aesthetically objectionable or in additional operating cost to the utility. An example of a common substance that is only an aesthetic concern is manganese occurring in natural groundwater.

Determining the "degree of hazard" is one of several factors in assessing the purveyor's risk of contamination of its water distribution system. If knowledge of the degree of hazard posed by a substance is not known, the purveyor must assume that it is high. Generally, almost all substances other than potable water are considered a health hazard of some degree. The end of the potable water system (e.g., faucet) is the start of the waste disposal system. Very few substances, therefore, can be assumed to be only an aesthetic concern.

PROBABILITY OF OCCURANCE

A cross connection is "any actual **or potential** physical connection between a potable water line and any pipe, vessel, or machine containing a non-potable fluid or has **the possibility** of containing a non-potable fluid..." The assessment of the probability also applies to degree of health hazard. The assessment of the probability also applies to the degree of health hazard. The assessment of the probability of the occurrence of a cross connection is not an exact procedure because of the lack of statistical data. The assessment is made in relative terms, based on the experience gained from cross connection control program managers.

The likelihood of a physical connection being made between the potable water system and any tank, vat or pipe containing a non-potable fluid, must be taken into consideration that:

- The probability increases that an existing cross connection will go undetected, as the complexity of a piping system increases,
- Piping changes will create new cross connections, or change the operating conditions (e.g., from backsiphonage to backpressure conditions), and
- A backflow preventer could be by-passed, removed from service, etc.

The likelihood of the substance in the connecting tank, vat or piping becoming a health hazard must take into consideration that:

- The substance could be changed or increased in strength)e.g., substitute of a toxic antifreeze for a non-toxic antifreeze),
- The substance may deteriorate, and thus become a health hazard (e.g., food products),
- The substance, when combined with the chemicals in the potable water supply, or when exposed to certain piping material, may react and form a compound that poses a health hazard, (e.g., CO_2 mixing with water to form carbolic acid that leaches copper from a service pipe), or
- The substance, if it contains a bacteriological contaminant, could become a health hazard long after it enters the potable water supply (e.g., through bacteria growth).

RELIABILITY OF BACKFLOW PREVENTERS

Any mechanical apparatus can fail to perform a designed. Failure may be the result of a design flaw, operating conditions that exceed design parameters, improper installation, normal wear on moving parts, corrosion, etc.

The reliability of a backflow preventer is directly related to:

- The design standard
- The quality assurance in manufacturing
- The proper installation and maintenance

The standards adopted by the American Water Works Association, the University of Southern California Foundation for Cross Connection and Hydraulic Research, and other standard writing organizations, normally contain the minimum design and performance requirements. The standards may include:

- Minimum material specifications,
- Minimum performance criteria,
- Minimum design criteria,

- Requirements for independent laboratory evaluation,
- Requirement for field evaluation

Not all standards for a given type of backflow assembly are equal. Not all product approvals given by standard writing organizations are equal. The purveyor must evaluate the various standards and specify the standards that it will accept for each type of backflow preventer.

Although a new backflow preventer may meet the performance and design criteria at the place of manufacture, after installation it will not continue to do so indefinitely. Maintenance or replacement is required of all backflow preventers.

The reliability of a backflow preventer to perform the task of stopping backflow is significantly increased by the ability to test it in the field to determine if it continues to properly function. Backflow preventers which are designed to be in-line tested and repaired, and to meet the head loss and flow requirements of the recognized approval agency are referred to as "assemblies."

To place a high degree of reliance upon the installation of a backflow prevention assembly, the assembly must be actually tested upon installation, minimum annually thereafter, and after moving or repair. Testing is precursory to maintenance. Test procedures should verify that the assembly meets the design standards; rather than detect that a component of the assembly has failed and allows backflow to occur. This ensures that maintenance will likely be performed before the assembly fails to prevent a backflow.

The qualifications of the person performing the field test are equally important as the field test procedures. Field tests performed by certified backflow assembly testers, following approved test procedures, significantly increases the purveyor's ability to rely on the performance of a backflow prevention assembly.

Generally, the design and performance standards for backflow prevention devises, such as an atmospheric vacuum breaker, are less stringent than those for backflow prevention assemblies. Because the design of a backflow prevention devise may not allow for in-line testing, or if a type of devise is not included in the purveyor's program for annual testing, a high degree of reliance can not be placed on the backflow prevention device's long-term performance.

ASSESSMENT OF RISK

The prerequisite to making a determination of the type of backflow preventer needed to isolate a specific cross-connection (e.g., a plumbing fixture), or a group of cross connections contained within a facility or complex of facilities (e.g., a shopping mall) is:

1) Determine the degree of hazard and probability of occurrence of the cross connection, and
2) Determine the acceptable risk, and
3) Determine the reliability required of the backflow preventer.

Table 32 and Table 33 along with Table 4-1; 4-2; 4-3; & 4-4 will help define the degree of hazard and required and/or recommended protection needs for different applications.

D. Procedure for notifying water users after the degree of hazard is determined and what corrective action is necessary:

1) Water users can be notified via local radio and television stations as identified in the Emergency Response Plan;
2) Police and fire vehicles have the ability to drive through the neighborhoods using public address systems alerting the public of the hazard with instructions;
3) City, County and Fire department employees may have to go door to door to make contact with residents warning of hazards and giving instructions;
4) In the event an emergency is declared, refer to the City of Eagle Point Emergency Management Plan found in the Water Department Emergency Response Plan;
5) If necessary, the main valves from the four reservoirs can be closed at the reservoirs discontinuing all water to all customers, this would also include fire protection so notification of this action would have to be relayed to the fire department;
6) Local testing lab has the ability to test for bacterial contamination; however, there is no local lab that can test for biological or certain chemical agents which may be introduced into the water supply. If any of these agents should be introduced into the water supply, a lengthy testing will occur with water samples having to be hand carried to the local State certified testing lab by either a water department employee, police officer, or State Health Department employee. A state of emergency will most likely be declared at that time. Refer to the Emergency Management Plan;
7) All water system facilities will need flushed, sanitized and tested before the system can be used again. Refer to the Water Department Emergency Management Plan for instructions;
8) The goal is to resume normal operations as quickly but safely as possible. Once the water has been declared safe and potable, the public shall be notified by the same process they were notified of the hazard;
9) Testing shall continue throughout the system in accordance with OAR testing schedules and procedures for the particular hazard detected;
10) Determine how and where the hazard was introduced into the water system. If determined the cause to be a faulty backflow prevention devise, discontinue water service to that location until the devise can be repaired and tested. If an act of terrorism is determined to be the cause, notify Law enforcement, the Oregon Health Division and the FBI immediately, which all agencies should be on scene at this point. Contact phone numbers are located in the Water Department Emergency Response Plan;
11) In the event of an act of terrorism, protect the point of the intrusion for law enforcement to investigate. Do not move or contaminate any evidence. Repair only after clearance from the investigating agency has released the scene to the water department.

E. Type of protection required:

1) Table 32 identifies the industries with hazardous materials and Table 33 lists the degree of hazard. Table 4-1 gives the level of protection for each type of protection. Table 4-2 lists the mandatory service isolations. Table 4-3 lists the recommended service isolations. Table 4-4 lists several types of business and industry applications with health hazard identified and levels of protection needed.
2) See OAR 333-061-0070 (1) thru (10) for detailed Backflow Prevention Assembly Installation & Operation Standards.
3) AIR GAP SEPARATION

   Air gap separations provide maximum protection from backflow hazards and may be utilized at premises where a substance is handled which would be hazardous to health if introduced into the potable water system.

   A. An air gap separation shall be at least double the diameter of the supply pipeline measured vertically above the top rim of the receiving vessel – in no case less than one (1) inch.

      If splashing is a problem, tubular screens may be attached or the supply line is cut at a 45 degree angle, the air gap distance is measured from the cent of the angle. Hoses are not allowed.

   B. Air gap separations shall not be altered in any way without prior approval from the City of Eagle Point and must be available for inspection at all reasonable times.

4.) ATMOSPHERIC VACUUM BREAKER (AVB)

   AVB's are approved backflow protection for landscape irrigation systems only. AVB's protect against backsiphonage only and shall not be installed where there is potential for backpressure.

   A. The devise shall be installed a minimum of six (6) inches above the highest use outlet or overflow level downstream from the device.
   B. Shut-off valves downstream from the device are not permitted.
   C. AVB's are permitted for only those applications where there is less than twelve (12) hours per day continuous use.
   D. AVB's shall not be installed in an area subject to flooding or where water damage may occur when the device discharges water.

5.) PRESSURE VACUUM BREAKER (PVB)

   PVB's may be utilized at premises where substance is handled which would be objectionable but not hazardous to health if introduced into the potable water system. PVB's protect against backsiphonage only and shall not be installed where there is potential for backsiphonage.

   A. The device shall be installed a minimum of twelve (12) inches above the highest use outlet or overflow level from the device.
   B. PVB's shall not be installed in an area subject to flooding or where water damage would occur when device discharges water.
   C. The device must be protected from freezing.

D. The device shall be readily accessible for testing and maintenance, with a minimum clearance of twelve (12) inches all around the device.
E. PVB's shall be located between twelve (12) inches and forty-eight (48) inches above ground level.
F. A strainer with blow out tapping is recommended ahead of the device.
G. All PVB's must be tested upon installation and at least once per year thereafter by an approved certified tester. Tests are the responsibility of the device owner. The owner must notify the City upon installation of any backflow prevention device.
H. Variances from these specifications will be evaluated on a case by case basis. Any deviations must have prior written approval by the City.

6.) DOUBLE CHECK VALVE ASSEMBLY

Double check valve assemblies may be utilized at premises where a substance is handled which would be objectionable but not hazardous to health if introduced into the potable water system.

A. DCV's must be sized to provide an adequate supply of water and pressure for the premises being served. Flow characteristics are not standard. Consult manufacturer's specifications for specific performance data.
B. Premises where interruption of water supply is critical should be provided with two devices installed in parallel. They should be sized in such a manner that either device will provide the maximum water requirements while the two together will provide the maximum flow required.
C. Bypass lines are not permitted. Pipe fittings which could be used for connecting a bypass line shall not be installed.
D. Backflow prevention devices which are installed to isolate premises from the public potable water system must be installed on the downstream side of the meter at or near the property line or immediately inside the building being served, but in any case must be installed before the first branch line.
E. Installation:

The device shall be readily accessible with adequate room for testing and maintenance. DCV's may be installed below grade, providing all test cocks are fitted with brass pipe plugs. All vaults shall be constructed of concrete, plastic, or other suitable materials, sized to make the vault readily accessible for testing and maintenance, and allow for the minimum clearances established below. Vault sides and bottom shall be solid to prevent collapse or rodent intrusions and shall be well drained.

Devices 2 inches or smaller shall have at least 6-inch clearance below and on both sides of the device, and if located in a vault, the bottom of the device shall be between 12 inches and 24 inches below grade. All devices larger than two (2) inches shall have a minimum clearance of 12 inches on the back side, 18 inches on the test cock side, 12 inches below the device, and 36 inches above the device. Headroom of 6' 0" is required in vaults without a full opening top. Access to the device and to any vault or chamber shall remain unrestricted at all times.

F. The device must be protected from freezing and other severe weather conditions.
G. A strainer with blow out tapping is recommended ahead of the device.
H. The property owner assumes all responsibility for foundation or basement wall penetration, leaks, and damage. The owner shall also see that the vault is kept reasonably free of silt and debris.
I. All DCV's must be tested upon installation and at least once per year thereafter by an approved certified tested. Tests are the responsibility of the device owner. The owner must notify the City upon installation of any backflow prevention device.
J. Variances from these specifications will be evaluated on a case by case basis. Any deviations must have prior written approval of the City.
K. Standard drawings are shown in Appendix.

7.) DOUBLE DETECTOR CHECK VALVE ASSEMBLY (DDC)

Double detector check valve assemblies may be substituted in all installations requiring a double check valve assembly and detector check.

A. DDC's shall comply with the installation requirements applicable for double check valve assemblies.
B. A remote reading register is required on all devices and must be installed within eight (8) inches of the vault lid.
C. Standard drawings of typical installations are show in Appendix.

8.) REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVISE (RPBD)

RPBD's may be utilized at premises where a substance Is handled which would be hazardous to health if introduced into the potable water system. The RPBD is normally used in locations where an air gap is impractical and is effective against both backsiphonage and backpressure.

A. RPBD's must be sized to provide an adequate supply of water and pressure for the premises being served. Flow characteristics are not standard. Consult manufacturer's specifications for specific performance data.
B. Premises where interruption of water supply is critical should be provided with two devices installed in parallel. They should be sized in such a manner that either device will provide the minimum water requirements while the two together will provide the maximum flow required.
C. Bypass lines are not permitted. Pipe fittings which could be used for connecting a by-pass line must not be installed.
D. Backflow prevention devices which are installed to isolate premises from the public potable water system must be installed on the downstream side of the meter at or near the property line or immediately inside the building being served, but in any case must be installed before the first branch line.
E. Installation:

The device must be readily accessible for testing and maintenance and must be located in a area where water damage to building or furnishings would not occur when the relief valve is flowing. If the relief valve is piped to discharge water away from the device, an approved air gap funnel assembly may be used. This assembly is designed to handle occasional minor discharges and

will not control flow in a continuous relief situation. Drain lines to accommodate full relief valve discharge flow should be considered. (Reference chart in Appendix).

RPBD's are typically installed above grade, with drainage openings located at the bottom of protective enclosure (at grade surface).

RPBD's may be installed below grade providing that an adequate drain is provided. Drains must be bore sighted to daylight.

Installation without drains must be located in suitable areas where the highest possible level of standing water is below the bottom of the device.

Any vault or enclosure must be sized to make the device readily accessible for testing and maintenance and allow for the minimum clearance established below. Sides and bottom of enclosure must be solid to prevent collapse or rodent intrusion. All enclosures must drain to daylight. Drain ports should be sized to accommodate full pressure discharge from the device. (Reference chart in Appendix).

Devices two (2) inches or smaller shall have at least 6 – inch clearance all around the device (some models require at least 12 inches below the device). All devices larger than two (2) inches shall have a minimum of 12 inches on the back side, 18 inches on the test cock side, 36 inches above the device, and the relief valve opening shall be at least 12 inches plus nominal size of device above the highest possible water level. Head room of 6' 0" is required in vaults without full opening top.

F. The device must be protected from freezing and other sever weather conditions.
G. Vertical installation is not permitted.
H. A strainer with blow out tapping is recommended ahead of the device.
I. The property owner assumes all responsibility for foundation or basement wall penetration, leaks, and damage. The owner shall also see that the vault is kept reasonable free of silt and debris.
J. All RPBD's must be tested upon installation and at least once per year thereafter by a State certified tester. Tests are the responsibility of the device owner. The owner must notify the City upon installation of any backflow prevention device.
K. Variances from these specifications will be evaluated on a case by case basis. Any deviation must have prior written approval of the City.

F. Penalties for not taking corrective action:

1) Water service to the premise can be discontinued if a Specialist determines a health hazard could exist and shall remain discontinued until such time documentation of

repair and inspection for a faulty assembly is presented to the City for approval. Any applicable charges for turning off and re-instating water service to the customer will apply.

2) Falsification of documents shall constitute immediate discontinuance of water service to the facility or facilities served by the falsified document(s). Re-connection shall occur only after corrected documents have been received by the City and a site inspection has been conducted and approved by a Specialist. Civil penalties may also be assessed to the party or parties falsifying any documents submitted to the City.

G. Records of assemblies and other data:

1) All testing records are maintained in the cross connection computer using Cross-Track 5.2 software. In addition to the devise testing records, Cross-Track 5.2 also provides letters for:
    - Follow ups;
    - Thermal expansion;
    - Scheduled test notices;
    - 1st warning notice;
    - 2nd warning notice;
    - 3rd warning notice;
    - Final shut-off notice.
2) All paper originals are maintained in a file for ten (10) years.

H. Public Education Program:

1) An article on the requirements for cross connection/backflow protection has been in the annual CCR report which is mailed to every water customer in the City. The primary focus has been targeted to residential devises and what applications require protection.
2) An instruction sheet written by the Jackson County Plumbing Inspectors outlining the requirements for backflow assembly installations are given out with every building permit issued by the City Building Department.
3) An information sheet on thermal expansion is given out with every building permit issued by the City Building Department.

Testers with Current Certifications

Tester	*Company*	*Address*	*Phone*	*Cell/Pager*	*Renewal Date*
Brian Akers	Rogue Valley Backflow Services	1151 Reiten Dr., Ashland, OR 97520	(541) 482-9464		
Bruce Bateman	Southern Oregon Backflow Services	P.O. Box 3760, Central Point, OR 97502	(541) 779-8927		
Cynthia Sander	SO Backflow Techs	934 NW Cooke Ave., Grants Pass, OR	(541) 779-8927		
Eric Knight	Performance Systems Integration	7324 SW Durham Road, Portland, OR 97224	(503) 641-2222		
Eric Schaafsma	Precision Backflow Test	964 SE M St, Grants Pass, OR 97526	(541) 476-0733		
Erin Akers	Rogue Valley Backflow Service	1151 Reiten Dr., Ashland, OR 97520	(541) 482-9464		
Greg Leon	Leons Backflow Testing	Box 858, Glide, OR	(541) 643-0431		
Guy Cutler	Performance Systems Integratiopn	7324 SW Durham Rd., Portland, OR 97224	(503) 641-2222		
Jeff Lowther	American Backflow	1125 Adams St. #B, Klamath Falls, OR 97601	(541) 850-2464		
Mark Bateman	B2 Backflow Service	2929 Butte Falls Hwy, Butte Falls, OR	(541) 941-1326		
Mark Bateman	Southern Oregon Backflow	P.O. Box 1545, Medford, OR 97501	(541) 779-8927		
Mark Jamieson	Rogue Valley Backflow Service	1151 Reiten Dr., Ashland, OR 97520	(541) 482-9464		
Philip Sander	Southern Oregon Backflow	P.O.Box 1545, Medford, OR 97501	(541) 779-8927		
Scott Bradley	Scott Bradley	P O Box 313, Medford, OR 97501	(541) 601-2259		
Shawn Welch	A-Team Backflow Service	PO Box 641, Shady Cove, OR 97539	(541) 621-9238		
Steve Lambert		176 Main St, Eagle Point, OR 97524	(541) 830-1240		
Steven Bradley	Bradley Excavation	P.O. Box 494, Talent, OR 97540	(541) 944-3025		

This list is provided as a convenience to our customers, and it may not include all available Backflow Assembly Testers. We do not recommend or guaranty any Testers. It is your responsibility to verify proper and current certification and other licensing requirements before hiring anyone to perform work on your premises.