

# **Town of Swepsonville**

## **Backflow and Cross-Connection Manual**

---

### **INTRODUCTION**

This document includes specifications for backflow prevention assemblies and installation and testing requirements of the assemblies. The ultimate goal is to provide protection for the water systems operated by the purveyor and to provide the highest quality drinking water possible to the free flowing tap. The participation of each customer in properly installing and maintaining a backflow assembly is one more step in assuring that the public drinking water is safe and clean.

### **BACKFLOW ASSEMBLIES SPECIFICATIONS**

#### *AIR GAP*

Minimum distance between the inlet or fill pipe and overflow rim shall be two (2) times the diameter of the fill pipe and no less than one (1) inch. If fill pipe is mounted to wall minimum distance is three (3) times the diameter of fill pipe.

#### *APPROVED BACKFLOW PREVENTION ASSEMBLIES*

Meets American Water Works Association (AWWA) and American Society of Sanitary Engineers (ASSE) standards and carries the ASSE seal, or is on the University of Southern California approval list. All double check assemblies must conform to ANSI/AWWA C510. All reduced pressure assemblies must conform to ANSI/AWWA C511.

#### *3/4" – 2" BACKFLOW PREVENTERS*

All backflow preventers must be factory assembled and installed as an assembly, including inlet and outlet shut off valves, unions and four test cocks. 3/4" – 2" assemblies will have bronze bodies with resilient union connections and bronze ball valves. Shut-off valves will be full port, line size, lever type or tee handle, 1/4 turn, bronze ball valves. Inlet shut-off valves shall be situated where the No. 1 test cock is on the inlet side of the inlet valve.

#### *4"-10" BACKFLOW PREVENTERS*

All backflow preventers must be factory assembled and installed as an assembly, including inlet and outlet shut off valves and four test cocks. 4" – 10" assemblies will have fusion bonded epoxy coated gray or ductile iron bodies. Valves will be flanged, hand wheel operated, resilient-seated gate valves. Double check assemblies and reduced pressure assemblies will have non-rising stem gate valves. Inlet shut-off valves shall be situated where the No. 1 test cock is on the inlet side of the inlet valve. Detector assemblies for sprinkler systems will have outside stem and yoke- rising stem gate valves on the main line and ball valves on the bypass side.

*DRAIN PIPING*

Pipe shall be schedule 40 PVC-DWV, cast iron soil pipe, or ductile iron. Drain outlet shall have a removable wire mesh screen to prevent rodent entry. Necessary steps must be taken to prevent outlet from damage or being covered over. Drain shall provide positive drainage above normal flood levels for vault or box.

*FITTINGS*

All fittings shall be ductile iron with a minimum pressure rating of 250 p.s.i. All flanges and glands shall be ductile iron. Interiors shall be cement lined with asphaltic seal coat. Exterior shall be coated with a bituminous coating.

*FLANGE PACKS*

Bolts shall be zinc plated, grade "B", low carbon steel in accordance with ASTM A-307.

PIPE DIAMETER	BOLT SIZE	BOLTS PER FLANGE
4"	5/8" X 3"	8
6"	3/4" X 3-1/2"	8
8"	3/4" X 3-1/2"	8
10"	7/8" X 4"	12

*GASKETS*

Gasket Material shall be 1/8" red rubber, ring or full face gaskets will be accepted.

*METERS*

All meters will be installed by the Town of Swepsonville.

*PIPING*

All piping shall be ductile iron. Piping inside vaults shall be flanged. Piping outside vaults shall be mechanical joint or restrained joint.

*STEPS*

All steps shall conform to current OSHA standards and ASTM C478. Steps shall be straight and in line, installed 12" on center with the first step 12" or less from the top rim of access door and the last step 12" or less from floor.

*SUPPORTS*

Supports shall be PVC cut to length and filled flush with concrete and centered under flanges.

## VALVES

Meter inlet and outlet shut-off valves, and by-pass valves shall be flanged, hand-wheel operated, non-rising stem, epoxy coated, resilient-seated gate valve.

## ABOVE GROUND ENCLOSURES

Above ground enclosures shall have an ASSE 1060 approval to protect from vandalism and freezing. The protective structure must provide easy access to the assembly for testing or removal. The structure must have adequate drainage provided by hinged door or drain ports. Structure shall be secured to a concrete pad a minimum of two (2) inches larger than enclosure. The same minimum and maximum clearances apply.

## VAULTS

Vaults shall be 4000 PSI reinforced pre-cast concrete designed to support an H-20 wheel load. A maximum of two (2) joints per vault will be allowed and the joints shall be sealed with butyl rubber sealant. All pipe connections shall be made with flexible sleeves which conform to ASTM C923. Butyl rubber shall be used between the vault and vault access door.

## VAULT ACCESS DOORS

All vault access doors shall be double leaf aluminum. Door leafs shall be minimum 1/4" aluminum diamond plate designed to withstand a live load of 300 pounds per square foot. Doors shall have a 1/4" aluminum channel frame with a continuous anchor flange. Doors shall have a recessed aluminum drop handle which does not protrude above the cover, and an automatic hold open arm. All 4' X 6" doors shall be hinged on the long side. Door hinges shall be stainless steel with tamperproof stainless steel nuts and bolts. The door hinges shall be removable to allow removal of a damaged door leaf. Each door shall have a stainless steel spring-loaded slam lock, operable from the outside by a square key wrench and from the inside by a fixed turn handle. The slam lock shall include a removable sealing plug. All doors shall have a mill finish with a bituminous coating applied on all surfaces that come in contact with concrete. In some cases doors designed to withstand H-20 wheel loading may be required. Concrete must be used under the support shelf in order to carry the H-20 load.

## INSTALLATION

All installations or replacements of a backflow prevention assembly must be done by a licensed plumber or a licensed utility contractor. Installation of a backflow prevention assembly shall be installed on the outlet side of the meter service.

Any customer installing a reduced pressure zone (RPZ), pressure vacuum breaker (PVB), double check-detector assembly (DCDA) or double check valve assembly (DCVA) shall submit a *Backflow Device Inventory* form to the Backflow Administrator within ten (10) days after installation.

### **Reduced Pressure Principle Assemblies (RPPA)**

All Reduced Pressure Principle Assemblies (RPPA) devices shall be installed in accordance with the manufacturer's installation instructions, and shall possess all test cocks and fittings required for testing the device. All fittings shall permit direct connection to approved test devices. Reduced Pressure Principle Assemblies shall be installed above ground in an approved enclosure located in an area free from submergence or flood potential. Devices shall be protected from freezing, vandalism, mechanical abuse, and from any corrosive, sticky, greasy, abrasive, or other damaging environment

The entire device, including test cocks and valves, shall be easily accessible for testing and repair. Clearance of device from wall surfaces or other obstructions shall be a minimum of six (6") inches. The relief port shall have a minimum clearance of twelve (12) inches or a maximum of thirty (30) inches to the concrete pad.

Devices shall be positioned where discharge from the relief port will not create undesirable conditions. An approved air-gap shall separate the relief port from any drainage system. An approved strainer, fitted with a test cock, shall be installed immediately upstream of the backflow device or shut-off valve.

Duplicate units, installed in parallel, shall be provided in cases where the water supply cannot be interrupted for routine testing and maintenance of a single unit installation.

### **Double Check Valve Assemblies (DCVA)**

Double Check Valve Assemblies (DCVA) may be installed in an ASSE1060 approved enclosure above ground or below ground in a vault. If a Double Check Valve Assembly is installed in a vault the size and clearance specifications are as follows:

3/4" - 1" DCVA's shall have a clearance of four (4) inches from the end walls to ball valves, eight (8) inches clearance on the side utilizing the test cocks and four (4) inches on the opposite side. Installation may be made in a standard meter box with a minimum four (4) inches of wash stone placed in the bottom of the meter box.

2" - 10" DCVA's shall be installed in a sealed H-20 traffic rated vault. Such vault shall have positive drainage by gravity to the surface of ground or a catch basin connected to a storm drainage system. If drainage can not be provided the assembly unit must be installed above ground in an ASSE1060 approved enclosure. The 2" (DCVA) shall have a clearance of four (4) inches from the end walls to ball valves, twelve (12) inches minimum clearance on the test side of the assembly and eight (8) inches minimum clearance on the opposite side. The 3"-10" (DCVA) shall have a clearance of eight (8) inches from the end walls to the ball valves, thirty (30) inches clearance on the test side of the assembly and twelve (12) inches clearance on the opposite side. All Double Check Valve Assemblies are required to have a minimum twelve (12) inches to a maximum (30) inches clearance from floor level to underside of body.

## **TESTING REQUIREMENTS**

The customer is responsible for ensuring a backflow prevention assembly is working properly upon installation. The consumer shall, at his own expense, conduct testing of a backflow prevention assembly by a certified backflow technician, approved by the Town of Swepsonville. Tests shall be conducted within ten (10) days of installation, and annually thereafter. Test results, and a description of any repairs, shall be submitted to the Backflow Administrator on forms provided by the Town within thirty (30) days of completion. The customer must maintain a file of these reports for no less than five (5) years.

Before beginning any tests or repairs on a fire protection system the customer will be responsible to notify all parties that could be effected by the shutting off of the water service during any procedures (i.e. alarm company, insurance agents, local fire officials).

If an assembly is in need of repair before the annual test period, the customer will be responsible to have repairs made immediately by an approved backflow technician. Any repaired assembly must be tested upon completion of any repairs. All repair parts must be of a manufacture's approval.

## **APPROVED CERTIFIED TESTERS**

Any person interested in testing backflow assemblies in the Town of Swepsonville must have a certification from an approved school providing certification in Backflow Prevention Testing and Cross-Connection Control. Application for tester certification by the Town must be made on a form provided by the Town. The following schools have been approved by the Town of Swepsonville:

## **REQUIREMENTS FOR TEST KITS**

All test kits used for testing backflow prevention assemblies shall meet the following requirements for approval by the Town of Swepsonville:

1. Must meet the requirements of the University of Southern California Foundation for Cross-Connection and Hydraulic Research standards for differential pressure gauges.
2. The Town of Swepsonville will require a calibration certificate (less than one year old) for each kit and re-calibration annually.
3. The test person must supply the Town of Swepsonville with the following information for each kit to be registered:

- Manufacture of kit
- Type of kit (Duplex/Differential)
- Serial Number
- Owner's Name, Address, and Phone

Date of Calibration

**CROSS CONNECTION AND BACKFLOW PREVENTION FORMS**

The following forms are to be used to apply for Town certification as a backflow prevention assembly technician, after the initial installation of a backflow prevention assembly, and when reporting any repair and/or testing results.