

Backflow & Cross Connection Control Program



Revised: September 26th, 2018

Table of Contents

1. Cross-Connection Control - General Policy	3
1.1 Purpose	4
1.2 Responsibility/Legal Authority	4
2. Definitions	4
2.1. Approved	4
2.2. Auxiliary Water Supply	4
2.3. Backflow	5
2.4. Backpressure	5
2.5. Backsiphonage	5
2.6. Backflow Preventer	5
2.6.1. Air Gap (AG)	5
2.6.2. Reduced Pressure Principle Backflow Preventer (RP)	5
2.6.3. Double Check Valve Backflow Preventer (DC)	5
2.6.4. Atmospheric Vacuum Breaker Backflow Preventer (AVB)	5
2.6.5. Pressure Vacuum Breaker Backflow Preventer (PVB)	5
2.7 Contamination	5
2.8 Cross Connection	5
2.9 Cross Connections – Controlled	5
2.10 Cross Connection Control by Containment	6
2.11 Customer	6
2.12 Hazard, Degree of	6
2.12.1 Hazard – Health	6
2.12.2 Hazard – Plumbing	6
2.12.3 Hazard – Non Health	6
2.12.4 Hazard – System	6
2.12.5 High Hazard	6
2.12.6 Low Hazard	6
2.13 Industrial Fluids System	6
2.14 Irrigation Quality Water	7
2.15 Pollution	7
2.16 Reclaimed Water	7
2.17 Service Connection	7
2.18 Water – Nonpotable	7
2.19 Water – Potable	7
2.20 Water Purveyor	7
2.21 Water – Used	7
3. Requirements	7
3.1 Water System	7
3.2 Reclaimed Water System	8
3.3 Policy	8
4. Backflow Determination	10
4.1. Residential Connections	10
4.2. Non-Residential Connections	11
4.3. Secondary Thermal Expansion Equipment	11
5. Installation and Maintenance	12

5.1. Types of Backflow Prevention Devices	12
Air Gap Separation	12
Atmospheric Vacuum Breaker (AVB)	14
Pressure Vacuum Breaker (PVB)	15
Reduced Pressure Backflow Preventer (RP)	16
Double Check Backflow Preventer (DC)	17
5.2 Testing, Maintenance, and Certification of Backflow Prevention Assemblies	18
5.3. Notification of Non-Compliance	19
5.4. Significant Non-Compliance	20
6. Appendix	20

**The Remainder of This Page Is
Intentionally Blank.**

1. Cross-Connection Control - General Policy

1.1 Purpose

The purpose of this program is:

- 1.1.1. To protect the public potable water supply of Bay Laurel Center Community Development District (hereinafter, the District) from the possibility of contamination or pollution by isolating within the customer's internal distribution system(s) or the customer's private water system(s) such contaminants or pollutants that could backflow into the public water system.
- 1.1.2. To promote the elimination or control of existing cross connections, actual or potential, between the customer's potable water system(s) and non-potable water systems, plumbing fixtures, and industrial piping systems.
- 1.1.3. To provide for the maintenance of a continuing program of cross-connection control that will systematically and effectively prevent the contamination or pollution of all potable water systems.

1.2 Responsibility/Legal Authority

The District has an approved cross connection control program as required by the Florida Administrative Code (FAC) 62-555.360. The current edition of the American Waterworks Association (AWWA) Manual M14 titled "Recommended Practice for Backflow Prevention and Cross Connection Control" is incorporated herein by reference; is available from the American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235, www.awwa.org; and is available for review at the District's Office located at 8470 SW 79th Street Road, Suite A Ocala, FL 34481. The District may amend this document from time to time to stay current with the most current rules and regulations.

The District, or its designee, shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through the water service connections. If in the judgment of the District, an approved backflow-prevention assembly is required (at the customer's water service connection; or, within the customer's private water system) for the safety of the water system, the District, or its designated agent, shall give notice in writing to said customer to install such an approved backflow prevention assembly(s) at specific location(s) on its premises. The customer shall immediately install such approved assembly(s) at its own expense; and, failure, refusal, or inability on the part of the customer to install, have tested, and maintain said assembly(s) shall constitute grounds for discontinuing water service to the premises until such requirements have been satisfactorily met. The District has the right to recover costs and seek legal remedies to enforce compliance with this rule. The prevailing party in any such enforcement proceedings shall be entitled to recover reasonable attorneys' fees through appellate proceedings.

2. Definitions

- 2.1. **Approved** - Accepted by the District as meeting an applicable specification stated or cited in this program or as suitable for the proposed use.
- 2.2. **Auxiliary Water Supply** - Any water supply on or available to the premises other than the purveyor's approved public potable water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source(s), such as a well, spring, river, stream, harbor and so forth; used waters (including Reclaimed Water or Irrigation Quality Water); or industrial fluids. These waters may be contaminated or polluted, or they may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

- 2.3. Backflow** - The undesirable reversal of flow in a potable water distribution system as a result of a cross connection.
- 2.4. Backpressure** - A pressure, higher than the supply pressure, caused by a pump, elevated tank, boiler, or any other means that may cause backflow.
- 2.5. Backsiphonage** - Backflow caused by negative or reduced pressure in the supply piping.
- 2.6. Backflow Preventer** - An assembly or means designed to prevent backflow.
- 2.6.1. Air Gap (AG)** - The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. These vertical, physical separations must be at least twice the inside diameter of the water supply outlet, never less than 1 inch (25 mm).
- 2.6.2. Reduced Pressure Principle Backflow Preventer (RP)** - The approved reduced pressure principle backflow prevention assembly consists of two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. These units are located between two tightly closing resilient seated shutoff valves as an assembly and equipped with properly located resilient-seated test cocks.
- 2.6.3. Double Check Valve Backflow Preventer (DC)** - The approved double check valve assembly consists of two internally loaded check valves, either spring loaded or internally weighted, installed as a unit between two tightly closing resilient seated shutoff valves and fittings with properly located resilient seated test cocks. This assembly shall only be used to protect against a non-health hazard (that is, a pollutant).
- 2.6.4. Atmospheric Vacuum Breaker Backflow Preventer (AVB)** - A backflow prevention device which is operated by atmospheric pressure in combination with the force of gravity. The unit is designed to work on a vertical plane only. The one moving part consists of a poppet valve which must be carefully sized to slide in a guided chamber and effectively shut off the reverse flow of water when a negative pressure exists.
- 2.6.5. Pressure Vacuum Breaker Backflow Preventer (PVB)** - A pressure vacuum breaker is similar to an atmospheric vacuum breaker except that the checking unit poppet valve is activated by a spring. This type of vacuum breaker does not require a negative pressure to react and can be used on the pressure side of a valve.
- 2.7. Contamination** - An impairment of a potable water supply by the introduction or admission of any foreign substance that degrades the quality and creates a health hazard.
- 2.8. Cross Connection** - A connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids such as chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may change the color or add odor to the water.
- 2.9. Cross Connections – Controlled** - A connection between a potable water system and a non-potable water system with an approved backflow-prevention assembly properly installed and maintained so that it will continuously afford the protection commensurate with the degree of

hazard.

- 2.10 Cross Connection Control by Containment** - The installation of an approved backflow-prevention assembly at the water service connection to any customer's premises, where it is physically and economically unfeasible to find and permanently eliminate or control all actual or potential cross connections within the customer's water system; or it shall mean the installation of an approved backflow-prevention assembly on the service line leading to and supplying a portion of a customer's water system where there are actual or potential cross connections that cannot be effectively eliminated or controlled at the point of the cross connection.
- 2.11 Customer** - The person, firm, association, corporation, government agency or other entity or organization who has entered into an agreement to receive potable water, irrigation quality water, and/or wastewater service from the District and who is liable for the payment of that potable water, irrigation quality water, and/or wastewater service and shall abide by all the District's Rules and Regulations.
- 2.12 Hazard, Degree of** - The term is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the public potable water system.
- 2.12.1 Hazard – Health** - A cross connection or potential cross connection involving any substance that could, if introduced in the public potable water supply, cause death, illness, spread disease or have a high probability of causing such effects.
- 2.12.2 Hazard – Plumbing** - A plumbing-type cross connection in a consumer's potable water system that has not been properly protected by an approved air gap or an approved backflow-prevention assembly.
- 2.12.3 Hazard – Non Health** - A cross connection or potential cross connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable, if introduced into the public potable water supply.
- 2.12.4 Hazard – System** - An actual or potential threat of severe damage to the physical properties of the public potable water system or the consumer's potable water system or of a pollution or contamination that would have a protracted effect on the quality of the potable water in the system.
- 2.12.5 High Hazard** - A cross connection or potential cross connection involving any substance that could if introduced into the potable water supply, cause death, illness, spread disease, or have a high probability of causing such effects.
- 2.12.6 Low Hazard** - A cross connection or potential cross connection involving any substance that generally would not be a health hazard, but would constitute a nuisance, or be aesthetically objectionable, if introduced into the domestic water supply.
- 2.13 Industrial Fluids System** - Any system containing a fluid or solution that may be chemically, biologically, or otherwise contaminated or polluted in a form of concentration, such as would constitute a health, system, pollution, or plumbing hazard, if introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated waters; all types of process waters and used waters originating from the public potable water system that may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis; circulating cooling waters connected to an open cool lug tower; and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters, such as wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, and so forth;

oils, gases, glycerin, paraffin, caustic and acid solutions, and other liquid and gaseous fluids used in industrial or other purposes for fire-fighting.

2.14 Irrigation Quality Water - Water from various sources of a quality sufficient for irrigation uses, including potable water, reclaimed water, and non-potable water.

2.15 Pollution - The presence of any foreign substance in water that tends to degrade its quality so as to constitute a non-health hazard or impair the usefulness of the water.

2.16 Reclaimed Water - Water that, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is not safe for human consumption.

2.17 Service Connection – The terminal end of a service connection from the public potable water system, that is, where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the customer’s water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any meter or backflow prevention assembly located at the point of delivery to the customer’s water system. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system.

2.18 Water – Nonpotable - Water that is not safe for human consumption or that is of questionable quality.

2.19 Water – Potable - Water that is safe for human consumption as described by the public health authority having jurisdiction.

2.20 Water Purveyor - The Owner or Operator of a potable water utility supplying a potable water supply to the public.

2.21 Water – Used - Any water supplied by a water purveyor from a public potable water system to a consumer’s water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

3. Requirements

3.1 Water System

3.1.1 The water system shall be considered as made up of two parts: utility system and customer’s system.

3.1.2 The District’s system shall consist of the source facilities and the distribution system, and shall include all those facilities of the water system under the complete control of the District, up to the point where the customer’s system begins.

3.1.3 The source shall include all components of the facilities utilized in the production, treatment, storage and delivery of water to the distribution system.

3.1.4 The distribution system shall include the network of conduits used for the delivery of water from the source to the customer’s system.

3.1.5 The customer's system shall include those parts of the facilities beyond the termination of the utility distribution system that are utilized in conveying utility-delivered domestic water to points of use.

3.2 Reclaimed Water System

3.2.1 Though reclaimed water systems are a tremendous conservation resource, they do pose risks if they are improperly maintained, operated or identified. To ensure public health and safety, safeguards are put in place and maintained as described below.

3.2.2 Only contractors approved by the District shall be allowed to perform installation, repairs, and modifications to the potable water system and reclaimed water system.

3.2.3 Inspections shall be made by a representative of the District to verify proper installation and repair.

3.2.4 Annual Inspections shall be made to the reclaimed water system to confirm no new cross connections exist; documentation of such inspections shall be maintained for a minimum of 5 years. In the event a cross connection is found, procedures will be followed as described below.

3.3 Policy

3.3.1 No water service connection to any premises shall be installed or maintained by the District unless the water supply is protected as required by State/Provincial laws and regulations and this Cross Connection Control Program. Service of water to any premises shall be discontinued by the District if a backflow prevention assembly required by this Cross Connection Control Program is not installed, tested, and maintained, or if it is found that a backflow prevention assembly has been removed, bypassed, or if an unprotected cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected.

3.3.2 The customer's system shall be open for inspection at all reasonable times to authorized representatives of the District to determine whether cross connections or other structural or sanitary hazards, including violations of these regulations, exist. When such a condition becomes known, the District shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with District requirements.

3.3.3 An approved backflow prevention assembly shall be installed on each service line to a customer's water system at or near the property line or immediately inside the building being served; but in all cases, before the first branch line leading off the service line wherever the following conditions exist:

3.3.3.1 In the case of premises having an auxiliary water supply that is not or may not be of safe bacteriological or chemical quality and that is not acceptable as an additional source by the District, the public potable water system shall be protected against backflow from the premises by installing an approved backflow prevention assembly in the service line, appropriate to the degree of hazard.

3.3.3.2 In the case of premises on which any industrial fluids or any other objectionable substances are handled in such a fashion as to create an actual or potential hazard to the public potable water system, the public potable water system shall be protected against backflow from the premises by installing an

approved backflow prevention assembly in the service line, appropriate to the degree of hazard. This shall include the handling of process waters and waters originating from the utility system that have been subject to deterioration in quality.

3.3.3.3 In the case of premises having (1) internal cross connections that cannot be permanently corrected and controlled, or (2) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impractical or impossible to ascertain whether or not dangerous cross connections exist, the public potable water system shall be protected against backflow from the premises by installing an approved high hazard backflow prevention assembly in the service line.

3.3.4 The type of protective assembly required under subsections 3.2.3.1, 3.2.3.2, and 3.2.3.3 shall depend on the degree of hazard that exists as follows:

3.3.4.1 In the case of any premises where there is an auxiliary water supply as stated in subsection 3.2.3.1 of this section and is not subject to any of the following rules, the public potable water supply system shall be protected by an approved air gap separation or an approved reduced pressure principal backflow prevention assembly.

3.3.4.2 In the case of any premises where there is water or substance that would be objectionable but not hazardous to health, if introduced into the public potable water supply system, the public potable water supply system shall be protected by an approved double check valve assembly.

3.3.4.3 In the case of any premises where there are any materials dangerous to health that is handled in such a fashion as to create an actual or potential hazard to the public potable water system, the public potable water system shall be protected by an approved air gap separation or an approved reduced pressure principle backflow prevention assembly. Examples of premises where these conditions will exist include wastewater treatment plants, wastewater pumping stations, chemical manufacturing plants, hospitals, mortuaries, and plating plants.

3.3.4.4 In the case of any premises where there are “uncontrolled” cross connections, either actual or potential, the public potable water system shall be protected by an approved air gap separation or an approved reduced pressure principal backflow prevention assembly at the service connection.

3.3.4.5 In the case of any premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make a complete facility cross connection survey, the public potable water system shall be protected against backflow from the premises by either an approved air gap separation or an approved reduced pressure principal backflow prevention assembly on each service to the premises.

3.3.4.6 In the case of any premises where, in the opinion of the District, an undue health threat is posed because of the presence of extremely toxic substances, the District may require an air gap separation at the service connection to protect the public potable water supply system. This requirement shall be at the discretion of the District and is dependent of the degree of hazard.

3.3.4.7 The District reserves the right to require any degree of backflow prevention

assembly at any location whether it is or is not listed in this policy where it deems necessary to protect the public water system from contamination.

- 3.3.5** Any backflow prevention assembly required herein shall be a model and size approved by the District. The term approved backflow prevention assembly shall mean an assembly that has been manufactured in full conformance with the standards established by the AWWA titled;

ANSI/AWWA C510-89 – Standard for Double Check Valve Backflow Prevention Assembly, and AWWA C511-89 – Standard for Reduced Pressure Principal Backflow Prevention Assembly, and have met completely the laboratory and field performance specifications of the Foundation for Cross Connection Control and Hydraulic Research (FCCCHR) of the University of Southern California established by “Specification of Backflow Prevention Assemblies” – Section 10 of the most current issue of the Manual of Cross Connection Control.

Said AWWA and FCCCHR standards and specifications have been adopted by the District. Final approval shall be evidenced by a “Certificate of Approval” issued by an approved testing laboratory certifying full compliance with said AWWA standards and FCCCHR specifications.

The following testing laboratory has been qualified by the District to test and certify backflow preventers: Foundation for Cross Connection Control and Hydraulic Research, University of Southern California, University Park, Los Angeles, CA 90089.

Testing laboratories, other than the laboratory listed above, will be added to an approved list as they are qualified by the District.

Backflow preventers that may be subjected to backpressure or backsiphonage that have been fully tested and have been granted a certificate of approval by said qualified laboratory and are listed on the laboratory’s current list of approved backflow prevention assemblies may be used without further testing or qualification.

- 3.3.6** It shall be the duty of the customer / user at any premises where backflow prevention assemblies are installed to have certified inspections and operational tests made at least once per year. In those instances where the District deems the hazard to be great enough, certified inspections may be required at more frequent intervals. These inspections and tests shall be at the expense of the water user and shall be performed by the assembly manufacturer’s representative, District personnel, or by a certified tester approved by the District. The customer / user shall provide adequate and proper space for the installation, operation and maintenance of backflow prevention devices. It shall be the duty of the District to see that these tests are made in a timely manner. The customer / user shall notify the District in advance when the tests are to be undertaken so that the customer / user may witness the test if so desired. These assemblies shall be repaired, overhauled, or replaced at the expense of the customer / user whenever said assemblies are found to be defective. Records of such tests, repairs, and overhaul shall be kept and sent to the District as completed.

4. Backflow Determination

- 4.1. Residential Connections** - Residential water services require backflow prevention assemblies when the following conditions arise:

- 4.1.1.** A residence utilizes an irrigation system.

- 4.1.2.** Operations are being conducted at the residences which require a higher level of backflow prevention.
- 4.1.3.** In the judgment of the Utility Director, a customer's installation has the potential to contaminate the public water system.
- 4.1.4.** Refusal of a customer / user to correct the deficiencies discovered on the premises will require the District to deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with District requirements.
- 4.2. Non-Residential Connections** – All non-residential water services shall be evaluated to determine the appropriate type of backflow prevention assembly based on the degree of hazard at the premises being served by the public potable water system. The backflow prevention assemblies shall be installed by the customer / user requesting service prior to the District providing the water service.
- 4.2.1.** If in the opinion of the District, or its designee, the customer's premises constitute a possible risk to contaminate the public water system, the District shall retain the right to make inspection. Refusal of a customer / user to provide reasonable access to his premise for the District shall be treated as non-compliant.
- 4.2.1.1.** The owners of the suspected premises shall be notified in writing ten (10) days in advance to secure an appointment for inspection of the premises. The owner or their authorized representative will be required to accompany the inspector during the inspection of the premises.
- 4.2.1.2.** Any deficiencies that require corrective action will be made in writing to the customer / user and shall be given ten (10) days to meet the requirements of this program.
- 4.2.1.3.** Upon conformance of the requirements in the notification letter, the owner shall immediately notify the District to schedule a date for re-inspection.
- 4.2.1.4.** Refusal of a customer / user to correct the deficiencies discovered during the inspection will require the District to deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with District requirements.
- 4.3. Secondary Thermal Expansion Equipment** - While the protection provided by backflow preventers clearly outweighs any drawbacks associated with them backflow preventers can create hazardous conditions by preventing the backflow of water from water heaters. According to plumbing regulations, all water heaters are required to have a Temperature & Pressure (T & P) valve. These valves are designed to open and discharge water from the water heater when the temperature or pressure reaches a critical level. However, these valves have a small percentage of failures, commonly attributed to improper installation and inappropriate usage or improper maintenance (T & P valves need to be exercised periodically). If the T & P valve fails and a backflow-preventer is installed on the potable water line, the pressure can build up to explosive levels since there is no place for the increased pressure to vent. When backflow preventers are installed, the customer / user shall install an additional pressure relief mechanism per Florida Plumbing Code.

5. Installation and Maintenance

5.1. Types of Backflow Prevention Devices

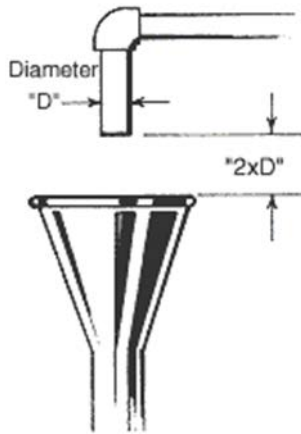
The following pages illustrate the various types of backflow prevention devices and typical methods of installation (outdoor).

Devices shall be installed as close as possible to the service connection in an accessible location. Backflow prevention devices installed indoors will vary in the method of installation based on location and configuration of the existing or proposed piping system. If the District deems indoor installation necessary to business transactions, then a determination will be made upon each request made.

Backflow Device	Health Hazard		Non-Health Hazard	
	Backsiphonage	Backpressure	Backsiphonage	Backpressure
Air Gap	X	X	X	X
Reduced Pressure Principle	X	X	X	X
Double Check Valve Assembly			X	X
Pressure Vacuum Breaker	X		X	
Atmospheric Vacuum Breaker	X		X	

The Remainder of This Page Is
Intentionally Blank.

Air Gap Separation



Description -

An approved air gap is a piping arrangement that provides an unobstructed vertical distance through free atmosphere between the lowest point of a water supply outlet and the overflow rim of an open, non-pressurized receiving vessel into which the outlet discharges.

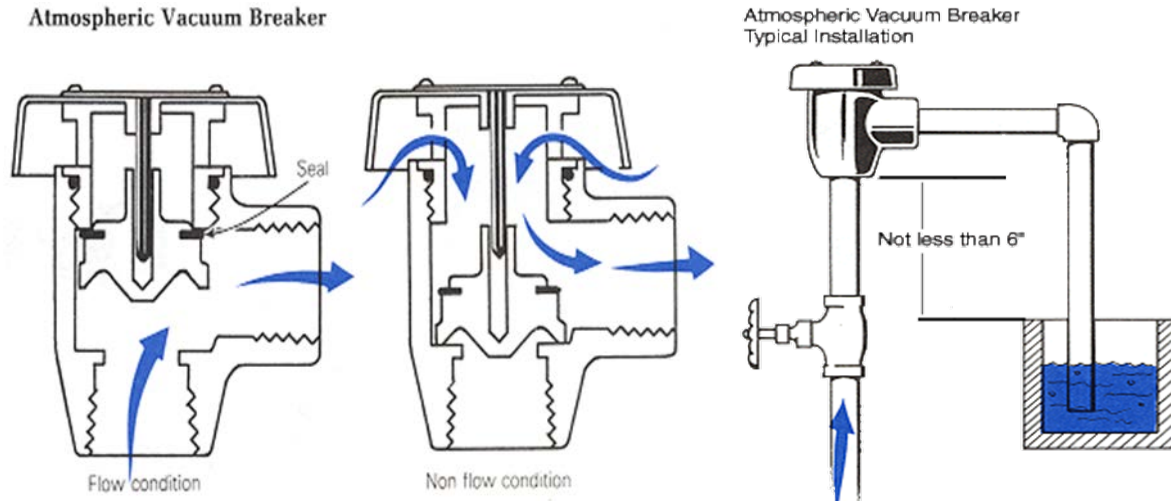
Application -

An air gap can be used for service or internal protection. A properly installed and maintained air gap is the best means to protect against backflow because it provides a physical separation between the water source and its use. Air gaps must be inspected at least annually to ensure that proper installation is maintained and has not been circumvented.

Installation Criteria -

An air gap's vertical physical separations must be at least twice the effective opening (inside diameter) of the water supply outlet but never less than 1 inch (25mm). Air gaps should not be approved for locations where there is potential for the atmosphere around the air gap to be contaminated. Nor should the inlet pipe be in contact with a contaminated surface or material; in a backsiphonage condition, an air gap can allow the surrounding atmosphere to enter the piping system, care must be taken to locate the air gap in such a way to ensure fumes or other airborne substances cannot be siphoned into the potable water system. The installation shall not include any interference with the free-flowing discharge into the receiving vessel. This means no solid material shields or splash protectors can be installed. Screen or other perforated material may be used if it presents no interference.

Atmospheric Vacuum Breaker (AVB)



Description -

An AVB shall contain an air-inlet valve and a check seat. The device shall be approved by an approval agency acceptable to the District. Water will enter the inlet of the AVB and cause the air-inlet poppet to seal against the air-inlet seat. After the poppet is sealed, water will flow through the AVB into the piping system. In a backsiphonage situation, the inlet pressure will be reduced to a sub-atmospheric pressure, causing the poppet to fall off the air-inlet seat and rest on the check seat. Air will enter the air-inlet port(s) to break any vacuum.

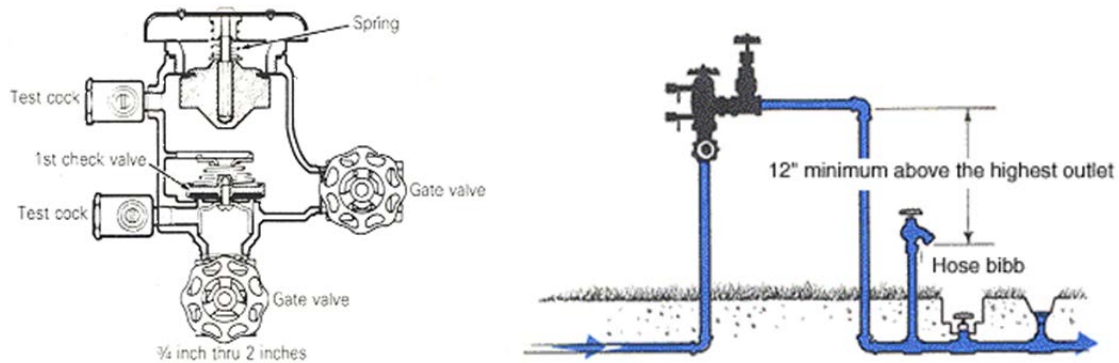
Application -

An AVB shall be installed to prevent backflow from backsiphonage only. AN AVB can protect both high and low hazard applications. An AVB is used for internal protection, for both indoor and outdoor applications. A wide variety of AVB's are produced for specific installations, such as lab faucets and many types of equipment that use built-in AVB's.

Installation Criteria -

An AVB shall not be installed where it could be subjected to backpressure. An AVB must not be installed in a pit or below grade where the air-inlet could become submerged in water or where fumes could be present at the air-inlet, because this installation may allow water or fumes to enter the device. An AVB shall be installed a minimum of 6 inches (152.5mm) above the highest point of use and any downstream piping coming from the device. An AVB shall not be subjected to continual use and shall not be pressurized more than twelve (12) hours in a twenty four (24) hour period. No control valve shall be installed on the downstream side of the AVB device.

Pressure Vacuum Breaker (PVB)



Description -

The PVB assembly shall contain and independently operating, internally loaded check valve and independently operating, loaded air-inlet valve located on the discharge side of the check valve. In addition, the PVB assembly shall have an inlet and outlet resilient-seated, fully ported shutoff valve and two (2) properly located resilient-seated test cocks. The PVB shall be installed as an assembly as designed and constructed by the manufacturer. The PVB shall be approved by an approval agency acceptable to the District. The check valve is designed to generate a loading able to hold a minimum of one (1) psi in the direction of flow with the outlet side of the check at atmospheric pressure. After water passes the check valve, it will cause the air-inlet poppet to close by overcoming the air-inlet loading, which is designed to be a minimum of one (1) psi. During normal operation, the check valve will open in response to demand for water on the downside and the air-inlet will remain closed. When the demand for water ceases, the check valve will close. In a backsiphonage condition the inlet pressure will be reduced to a sub-atmospheric pressure. The check valve will close because of the higher pressure on the downstream side of the check valve. When the pressure on the downstream side of the check valve falls to the air-inlet opening point (minimum of 1 psi), the air inlet will open to ensure that any vacuum is broken. If the check valve does not seal properly the area after the check valve will decrease in pressure, causing the air inlet poppet to come off the air-inlet seat; this action will open and break any vacuum by allowing air to be siphoned into the plumbing system instead of the downstream water.

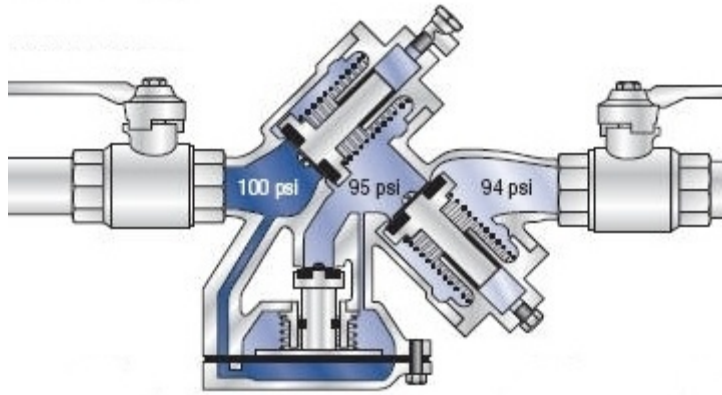
Application -

The PVB is an assembly designed to prevent backflow only from backsiphonage. The PVB can be used for both high and low hazard applications. The PVB can be used for internal protection. The PVB is normally not used for service protection because of its inability to protect against backpressure. However, a PVB may be used for service protection if the service is a designated, single use service, such as an irrigation system.

Installation Criteria -

A PVB shall not be installed where it could be subjected to backpressure. An AVB must not be installed in a pit or below grade where the air-inlet could become submerged in water or where fumes could be present at the air-inlet, because this installation may allow water or fumes to enter the assembly. A PVB shall be installed a minimum of twelve (12) inches (305mm) above the highest point of use and any downstream piping supplied from the assembly.

Reduced Pressure Backflow Preventer (RP)



Description -

An RP is an assembly that shall contain two (2) loaded, independently acting check valves with a hydraulically operating, mechanically independent pressure-differential relief valve located between the check valves below the first check valve. The check valves and the relief valve shall be located between two (2) tightly closing, fully ported, resilient-seated shut off valves. The RP shall have four (4) properly located resilient-seated test cocks. The RP shall be installed as an assembly as designed and constructed by the manufacturer. The RP shall be approved by an approval agency acceptable to the District. An RP is designed to maintain a pressure that is lower after the first check than it is at the inlet. The water pressure into the RP will be reduced by the amount of the first check loading (minimum of 3 psi higher than the relief-valve opening point). When the pressure is reduced after the first check, the relief valve senses the difference between the inlet pressure (before the first check) and the pressure after the first check. The relief valve ensures that the pressure after the first check is always lower than the inlet pressure by the amount of the relief-valve opening point, which shall be a minimum of two (2) psi. If the pressure in the area after the first check increases to within a minimum of two (2) psi less than the inlet pressure, the relief valve will open to ensure that a lower pressure is maintained. The second check is located downstream from this relief valve. The second check will also reduce the pressure by the amount of the check loading, which is a minimum of one (1) psi. In a normal flowing situation, both check valves will be open to meet the demand for water and the relief valve will stay closed. When the demand for water ceases, both checks will close and the relief valve will stay closed. In a backpressure condition, both check valves will close, and the second check will stop the increased pressure from traveling into the area between the two (2) checks. If the second check were not maintaining its separation of pressure, the backpressure would leak past the second check and cause the pressure in the area between the two (2) checks to increase. After the increase in pressure rises to the inlet pressure less the relief-valve opening point (minimum of 2 psi), the relief valve will open and discharge water from the assembly to the atmosphere. This discharge from the relief valve ensures that the pressure after the first check is always lower than the inlet pressure. In a backsiphonage condition, the inlet pressure will be reduced to a sub-atmospheric pressure. The pressure downstream from the first check which will cause the relief valve to open and discharge the water to the atmosphere.

Reduced Pressure Backflow Preventer (RP)

Continued

Application -

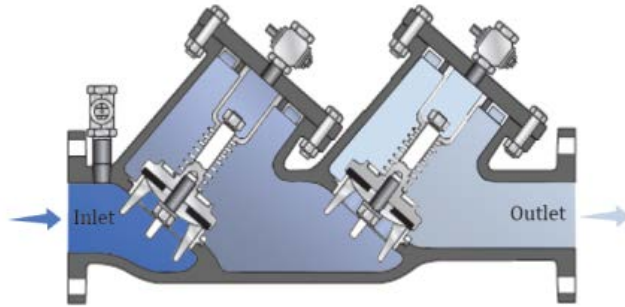
The RP is an assembly designed to prevent backflow from backpressure and/or backsiphonage. An RP can be used for both high and low hazard applications. An RP can be used for service protection or internal protection.

Installation Criteria -

An RP must not be installed in a pit or below grade where the relief valve could become submerged in water or where fumes could be present at the relief valve discharge, because this installation may allow water or fumes to enter the assembly. An RP shall be installed a minimum of twelve (12) inches (305mm) above the relief valve discharge-port opening and the surrounding grade and flood plain (as regulated). If the RP discharge is piped to a drain, an air gap separation must be installed between the relief valve discharge opening and the drain line leading to the drain.

**The Remainder of This Page Is
Intentionally Blank.**

Double Check Backflow Preventer (DC)



Description -

The double check valve backflow prevention assembly shall contain two (2) internally loaded, independently operating, approved check valves; two (2) resilient seated shut off valves; and four (4) properly located test cocks. The DC shall be installed as an assembly as designed and constructed by the manufacturer. The DC shall be approved by an approval agency acceptable to the District. The check valves are designed to generate a loading able to hold a minimum of one (1) psi in the direction of flow of the check valve, with the outlet side of the check at atmospheric pressure. During normal operation, the check valves will open in response to demand for water at the outlet. When the demand for water ceases, the check valves will close. In a backpressure condition, the increase in pressure on the outlet will cause the second check to close. If the second check does not seal properly. The first check will act as a backup to the second check. In a backsiphonage condition, the inlet pressure will be reduced to a sub-atmospheric pressure. The greater pressure on the downstream side on the second check will cause the second check to close. If the second check does not seal properly, the first check will act as a backup.

Application -

The DC is an assembly designed to prevent backflow from backpressure and/or backsiphonage. A DC can be used only for low hazard applications. A DC can be used for service protection or internal protection.

Installation Criteria -

A DC should not be installed in a pit or below grade when possible. If the DC must be installed in a vault, adequate space for testing and maintenance must be provided. If the DC must be installed below grade, the test cocks must be sealed or plugged so that water or debris cannot collect in the test cocks. When a DC is installed above ground the DC shall be installed a minimum of 12 inches above grade.

5.2 Testing, Maintenance, and Certification of Backflow Prevention Assemblies

All backflow prevention devices shall be tested at a minimum of once yearly. A record of each

test shall be kept on file for at least five (5) years. The District shall require testing and maintenance for backflow devices which have been specifically required. Maintenance and testing of backflow devices required by the District shall be the responsibility of the customer. Testing of required and recommended devices shall be performed in accordance with the most current AWWA Manual of Water Supply Practices M14, Recommended Practices for Backflow Prevention and Cross Connection Control. Responsibility for the testing and maintenance of required and recommended backflow prevention devices, including the payment of any testing fees, past the point of connection at the water meter, shall be the responsibility of the customer. Testing and Maintenance requirements shall be performed as specified by the District at no cost to the District.

Customers operating and maintaining backflow prevention assemblies shall be notified as to the required testing frequency by the District. Upon completion of the test, a completed and signed form shall be furnished to the District. Failure on the part of a customer to provide a completed form shall be treated as non-compliance. Testing and Maintenance on required assemblies shall be performed by a certified master plumber, certified backflow prevention tester or other individual with equivalent training acceptable to the District as approved in writing. Information concerning testing and maintenance of recommended backflow prevention assemblies shall be provided to customers upon request by the District.

The customer shall have thirty (30) days to complete the required testing. Should a customer fail to test or maintain a required backflow prevention assembly within the specified time, the District shall issue, by certified mail, a non-compliance notice. The customer shall have ten (10) days to:

- 5.2.1.** Provide the District with a completed test result form which indicates acceptable performance of the backflow prevention unit;
- 5.2.2.** Request the services of the District to perform required testing and maintenance procedures. The District will inform the requesting party as to its ability to provide services. Such services shall be paid for by the customer pursuant to the Backflow Prevention Device Charge.
- 5.2.3.** Penalties may be assessed for the following reasons, but not limited to:
 - 5.2.3.1.** Failure to grant access for inspections;
 - 5.2.3.2.** Failure to install;
 - 5.2.3.3.** Failure to repair.

5.3. Notification of Non-Compliance

If a customer elects not to test a backflow prevention assembly, as required by the District, the District will provide a non-compliance notice to the customer advising of the testing requirements and due date. If the District is not notified within 10 days by the customer of their intentions to have the assembly tested by a third party, the District shall provide the required testing services and include charges on the customer's monthly water bill. In the event the backflow prevention assembly fails, the District will make necessary repairs, up to and

including replacement of the assembly, to bring the assembly into compliance to the minimum specifications and the customer will be billed time and materials for these services on their monthly water bill.

5.4. Significant Non-Compliance

If the District is unable to complete certification and testing of backflow prevention assemblies as previously described, and seeks to suspend service, the District shall notify the customer of the nature of the violation for which suspension of service is sought with sufficient specificity as to the character of the violation and the dates at which such violation occurred. Such notice shall be sent to the customer by certified mail, return receipt requested, or personally delivered at least ten (10) days prior to the scheduled disconnection date.

5.4.1. The District Manager, or his designee, may place an order to the customer indicating a specified time which is dependent on the severity of the violation, when water service may be discontinued unless satisfactory corrective action to permanently remove the offending connection from the public water system is taken by the customer.

5.4.2. Any customer aggrieved by such an order may appeal it to a court of competent jurisdiction within ten (10) days from the date the order is delivered by certified mail unless such connection is in the opinion of the District is a direct threat to public health, welfare or safety. In such a case, the District shall retain the right to immediately discontinue service.

6. Appendix

6.1. FORM A: Backflow Assembly Test and Maintenance Report Form

**The Remainder of This Page Is
Intentionally Blank.**

6.1 FORM A

Backflow Assembly Test and Maintenance Report Form

Date: _____

Customer Name/Business Name: _____

Street Address: _____

Account Address (If different from Street Address): _____

Assembly Manufacturer: _____

Assembly Type: _____

Assembly Serial Number: _____ Assembly Model Number: _____

Assembly Location: _____ Size: _____

Tested By (Print): _____

Check Valve No. 1	Relief Valve	Check Valve No. 2	Pressure Vacuum Breaker
<input type="checkbox"/> Leaked or <input type="checkbox"/> Closed Tight	Opened at: _____ psi Or did not open <input type="checkbox"/>	<input type="checkbox"/> Leaked or <input type="checkbox"/> Closed Tight	<i>Air Inlet:</i> did not open <input type="checkbox"/> Or opened at: _____ psi
Gauge pressure across Check valve: _____ psi	Outlet shut-off valve: <input type="checkbox"/> Leaked <input type="checkbox"/> Closed	Gauge pressure across Check valve: _____ psi	<i>Check Valve:</i> Leaked <input type="checkbox"/> Or held at: _____ psi
<input type="checkbox"/> Cleaned only Replaced: Rubber Kit <input type="checkbox"/> CV Assembly <input type="checkbox"/> or Disc <input type="checkbox"/> O-rings <input type="checkbox"/> Seat <input type="checkbox"/> Spring <input type="checkbox"/> Stem/guide <input type="checkbox"/> Retainer <input type="checkbox"/> Lock nuts <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> RV Cleaned only Replaced: Rubber Kit <input type="checkbox"/> RV Assembly <input type="checkbox"/> or Disc <input type="checkbox"/> Diaphragm <input type="checkbox"/> Seat <input type="checkbox"/> Spring <input type="checkbox"/> Stem/guide <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Cleaned only Replaced: Rubber Kit <input type="checkbox"/> CV Assembly <input type="checkbox"/> or Disc <input type="checkbox"/> O-rings <input type="checkbox"/> Seat <input type="checkbox"/> Spring <input type="checkbox"/> Stem/guide <input type="checkbox"/> Retainer <input type="checkbox"/> Lock nuts <input type="checkbox"/> Other <input type="checkbox"/>	<input type="checkbox"/> Cleaned only Replaced: Rubber Kit <input type="checkbox"/> CV Assembly <input type="checkbox"/> Disc, Air Inlet <input type="checkbox"/> Disk CV <input type="checkbox"/> Seat CV <input type="checkbox"/> Spring Air Inlet <input type="checkbox"/> Spring CV <input type="checkbox"/> Retainer <input type="checkbox"/> Stem/guide <input type="checkbox"/> O-rings <input type="checkbox"/> Other <input type="checkbox"/>
Gauge pressure across Check valve: _____ psi	Relief valve opened at: _____ psi	Gauge pressure across Check valve: _____ psi	Air inlet: _____ psi Check Valve: _____ psi

Remarks: _____

I hereby certify that this data is accurate and reflects the proper operation and maintenance of this assembly.

Tester Signature: _____ Cert. No.: _____ Date: _____

Time: _____

This Assembly: PASSED FAILED BUFFER: _____ psi