

CROSS-CONNECTION CONTROL PROGRAM



WOONSOCKET WATER DIVISION
1500 MANVILLE RD.
WOONSOCKET, RI 02895

Approved by City of Woonsocket

Date November 16, 2015

Final

Woonsocket Water Division Cross-Connection Control Program

I. Authority

- a. This program is implemented pursuant to the federal Safe Drinking Water Act of 1974, RI General Laws 46-13-22, and Rhode Island Department of Health Rules and Regulations Pertaining to Public Drinking Water, Section 9.0: As Amended April 2009. Pursuant to these authorities the City of Woonsocket, Water Division has the primary responsibility for preventing water from unapproved sources, or any other substances, from entering the public potable water system.

II. Policy

- a. To protect the public potable water supply served by the Woonsocket Water Division from the possibility of contamination or pollution, by containment of the customers' service connection for such contaminants or pollutants which could backflow or backsiphon into the public water system.
- b. To promote the elimination or control of existing cross-connections, actual or potential, between its customers' in-plant potable water system, and non-potable systems.
- c. To provide for the maintenance of a continuing program of cross-connection control, this will effectively prevent the contamination or pollution of all potable water systems by cross-connection.

III. Definitions

- a. Approved: Accepted by the Director of Public Works as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.
- b. ABPA: American Backflow Prevention Association
- c. Auxiliary Water Supply: Any water supply, on or available, to the premises other than the purveyor's approved public potable water supply.
- d. Backflow: The flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.
- e. Backpressure: A condition in which the Owner's system pressure is greater than the supplier's system pressure.

- f. Backsiphonage: The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.
- g. Backflow Preventer: A device or means designed to prevent backflow or backsiphonage. Most commonly categorized as air gap, reduced pressure principle device, double check valve assembly, pressure vacuum breaker, atmospheric vacuum breaker, hose bib vacuum breaker, residential dual check, double check with intermediate atmospheric vent, and barometric loop.
- i. Air Gap: The term “air gap” indicates a physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. Air gaps are at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel with a minimum of at least 1 inch (ASME A112.1.2-2004).
 - ii. Atmospheric Vacuum Breaker Backsiphonage Prevention Assembly (AVB): Atmospheric vacuum breaker backsiphonage preventers or AVB (also known as the nonpressure type vacuum breaker) are assemblies that contain an air inlet valve, a check seat, and one or more air inlet ports. The flow of water into the body causes the air inlet valve to close the air inlet ports. When the flow of water stops, the air inlet valve falls and forms a check valve against backsiphonage. At the same time, it opens the air inlet ports allowing air to enter and satisfy the vacuum. A shutoff valve immediately upstream may be an integral part of the assembly, but the assembly should not be subjected to operating pressure for more than twelve hours in any twenty-four hour period. An atmospheric vacuum breaker is designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only (FCCCHR, 1993).
 - iii. Barometric Loop: A fabricated piping arrangement rising at least thirty-five (35) feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against backsiphonage.
 - iv. Double Check Valve Backflow Prevention Assemblies: Double check valve backflow preventers are composed of two independently acting check valves, including tightly closing resilient seated fully ported shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. These assemblies should only be used to protect against a non-health hazard (i.e., pollutant).
 - v. Double Check Valve with Intermediate Atmospheric Vent: A device having two (2) spring loaded check valves separated by an atmospheric vent chamber.

- vi. Hose Connection Vacuum Breakers: Hose Connection Vacuum Breakers (ASSE, 2004A) are designed to be installed on the discharge side of a hose bib. When not under pressure, the checking member is loaded to the closed position, while the atmospheric port(s) are loaded to the open position. These devices are intended for non-continuous use (i.e., 12 hours use in 24-hour period).
- vii. Hose Connection Backflow Preventer: Hose Connection Backflow Preventers (ASSE, 2005) are designed to be installed on the discharge side of a hose bib. This two-check device protects against backflow, due to backsiphonage, and low-head backpressure. This device shall only be used on systems where sources of backpressure are not introduced. This device shall only be used on hose bibs where the low-head backpressure does not exceed that generated by an elevated hose equal to or less than 3 meters (10 ft.) in height. This device shall not be subjected to more than twelve (12) hours of continuous water pressure.
- viii. Pressure Vacuum Breakers: Pressure vacuum breaker backsiphonage prevention assemblies contain an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assemblies are equipped with resilient seated test cocks and tightly closing resilient seated fully ported shutoff valves attached at each end of the assembly. These assemblies are designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only.
- ix. Spill-Resistant Pressure Vacuum Breakers: Spill-resistant pressure vacuum breaker backsiphonage preventers contain an independently operating, internally loaded check valve and independently operating loaded air inlet valve located on the discharge side of the check valve. These assemblies are equipped with a resilient seated test cock, a bleed/vent port and tightly closing, resilient seated, fully ported shutoff valves attached at each end of the assembly. These assemblies are designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only.
- x. Reduced Pressure Principle Backflow Prevention Assemblies: Reduced pressure principle backflow preventers contain two independently acting check valves together with a hydraulically operating, mechanically independent, pressure differential relief valve located between the check valves and at the same time below the first check valve. The units include resilient seated test cocks and tightly closing, resilient seated, fully ported shutoff valves at each end of the assembly. These assemblies are designed to protect against a non-health (i.e., pollutant) or a health hazard

(i.e., contaminant). This assembly should not be used for backflow protection of sewage or reclaimed water.

xi. Residential Dual Check:

1. Dual Check Backflow Preventer (ASSE, 2004B) – These devices contain two internally loaded check valves. These devices are intended to protect the potable water supply from non-health hazards at residential service lines and individual outlets.
2. Dual Check with Intermediate Atmospheric Vent (ASSE, 2002) – These devices contain two independently operating loaded check valves separated by an intermediate chamber with a means for venting to the atmosphere. These devices are designed to give protection against low hazard backpressure and/or backsiphonage conditions on individual outlets. They are not designed nor intended for building isolation or high hazard conditions.
3. Residential Dual Check devices, as defined herein, are not typically designed to accommodate testing and are therefore treated as non-testable for purposes of this plan.

- h. Containment: A method of backflow prevention which requires backflow preventer at the water service entrance.
- i. Contaminant: A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or the spread of disease.
- j. Cross-Connection: Any actual or potential connection between the public water supply and a source of contamination or pollution.
- k. Director of Public Works: The Director or his/her delegated representative in charge of the Woonsocket Water Division is invested with the authority and responsibility for the implementation of a cross connection control program and for the enforcement of the provisions of the Ordinance.
- l. Fixture Isolation: A method of backflow prevention in which a backflow preventer is located to correct a cross connection at an in-plant location rather than at a water service entrance. Jurisdiction is under RI Plumbing Code.
- m. Internal Backflow Preventer: A backflow preventer located downstream of a containment backflow preventer. Jurisdiction is under RI Plumbing Code.
- n. Lead Free: Not containing more than 0.2% lead in solder and flux; not more than a weighted average of 0.25% lead in wetted surfaces of pipes, pipe and plumbing

- fittings and fixtures. As defined by Federal -Reduction of Lead in Drinking Water Act – 2011 which modifies the Safe Drinking Water Act of 1974 as amended by Lead Contamination Control Act of 1988 to re-define Lead Free regarding pipes, pipe fittings, plumbing fittings and fixtures.
- o. NEWWA: New England Water Works Association
 - p. NIST: National Institute of Standards and Technology
 - q. Owner: Any person who has legal title to, or license to operate or habitat in a property upon which a cross-connection inspection is to be made or upon which a cross-connection is present.
 - r. Person: Any individual, partnership, company, public or private corporation, political subdivision or agency of the State Department, agency or instrumentality or the United States or any other legal entity.
 - s. Pollutant: A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably affect such water for domestic use.
 - t. RIDOH: Rhode Island Department of Health
 - u. Water Service Entrance: That point in the Owner's water system beyond the sanitary control of the District; generally considered to be the outlet end of the water meter and always before any unprotected branch.
 - v. WWD: Woonsocket Water Division

IV. Responsibility: The Director of Public Works will operate this cross-connection program with the goal of the protection of the public potable water distribution system from contamination or pollution due to the backflow or backsiphonage of contaminants or pollutants through the water service connection. If, in the reasonable judgment of the Director, an approved backflow device is required at the city's water service connection to any customer's premises, the Director, or his/her delegated agent, shall give notice in writing to said customer to install an approved backflow prevention device at each service connection to his/her premises.

- a. Woonsocket Water Division Responsibility
 - i. The WWD recognizes that any backflow preventer can fail and that any method of protection can be compromised. For these reasons, periodic testing and inspection are necessary. The WWD will, as needed, perform inspections for actual or potential cross-connections. These inspections

will be made during normal business hours unless other arrangements are necessary. The WWD, as a condition of service, reserves the right to perform periodic testing or observe testing as performed by qualified individuals. This includes air gap protection.

- ii. The WWD will, after inspection or review of plans or third party inspection reports, notify the owner by letter of any necessary correction, the method of making corrections, and any additional customer responsibility such as required testing. The recommendations will be made based on the level of hazards observed during the inspection and the current perceived use of the building. An upgrade in backflow prevention to a higher hazard device may be required should new information be received or observed during inspection or if a change in use occurs. . If disconnection is required due to failure of compliance regarding testing, installation, proper maintenance WWD will notify the customer and specify the failure that requires correction.
- iii. Ordinarily, unless otherwise agreed to by the WWD, forty-five (45) days will be allowed, for correction of a low level hazard, ten (10) days for a moderate to high hazard, however, this time period may be shortened depending upon the degree of hazard involved and the history of the device(s) in question.
- iv. The WWD will not allow any cross-connection to remain unless it is protected by an approved backflow preventer and which will be regularly tested and inspected to ensure satisfactory operation.
- v. Any existing backflow preventer shall be allowed by the WWD to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present backflow preventer, or result in an unreasonable risk to the public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow preventer must be upgraded to a reduced pressure principle device, or a reduced pressure principle device must be installed in the event that no backflow device was present.
- vi. If the WWD determines at any time that a serious threat to the public health exists, the water service will be terminated immediately.
- vii. The WWD recognizes the threat to the public water system arising from cross connections. All threats will be classified by degree of hazard and will require the installation of approved reduced pressure principle backflow prevention devices or double check valves. Residential services, at a minimum, will require a non testable Dual Check Back Flow Preventer being warranted by degree of hazard.

- viii. The WWD will initiate and maintain the following: A program to educate customers on, at a minimum, thermal expansion in closed loop systems and limitations on the protection of water downstream of the service connection.
- ix. The WWD will provide standardized survey forms, reports and required notifications used by WWD. See Appendix A. The WWD will maintain the required records related to the master list of service connections relying upon approved backflow preventers, inventory information on approved air gaps or backflow preventers and records related to inspections, tests and test results, and program summary reports and backflow incident reports.
- x. All use of fire hydrants, public or private, except for firefighting purposes will need approval of the WWD and appropriate backflow deemed necessary by the WWD. Use of a public hydrant, backflow prevention device must be provided by the WWD with expense to the responsible customer. Use of a private hydrant, backflow prevention device may be supplied by the WWD with expense to the customer or supplied by the customer with specifications (type of backflow preventer, configuration of check valves, reducers, etc.) approved by the WWD.

a. Owner Responsibility

- i. The Owner shall be responsible for the elimination or protection of all cross-connections on his/her premises. Pursuant to RIDOH regulations (RIDOH Rules Section 9.4(a)), the installation of backflow preventers is required at all newly constructed service connections prior to the provision of water service and at all pre-existing residential and non-residential service connections.
- ii. The Owner, after having been informed by a letter requiring action by the Owner, shall inform the WWD of corrective actions to be taken. Owner shall at his/her expense, install, maintain, and test, or have tested, any and all backflow preventers on his/her premises.
- iii. All testable backflow preventers shall be tested at the time of installation, immediately after repairs or relocation and at least annually. Backflow prevention devices will be tested more frequently in cases where there is a history of test failures and the WWD feels that due to the degree of hazard involved, additional testing is warranted. Cost of the additional tests will be borne by the Owner. **The WWD recognizes that residential backflow preventers are not currently designed to be tested, and therefore residential backflow preventers are not subject to the annual testing requirement.**

- iv. The WWD will require that any backflow preventer which fails during a periodic test or inspection will be repaired or replaced. When repairs are necessary, upon completion of the repair the device will be re-tested at Owner's expense to ensure correct operation. High hazard situations will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be repaired immediately. In other situations, a compliance date of not more than thirty (30) days after the test date will be established. The Owner is responsible for spare parts, repair tools, or a replacement device. Parallel installation of two (2) devices is an effective means of the Owner insuring that uninterrupted water service during testing or repair of devices and is strongly recommended when the Owner desires such continuity.
- v. Reduced pressure principle backflow devices shall be tested and inspected at least annually. Test results, including the testers name and certification number, are to be reported to the WWD. Incorrect forms or incomplete information will require a retest.
- vi. The Owner shall correct any malfunction of the backflow preventer which is revealed by periodic testing.
- vii. The Owner shall inform the WWD of any proposed or modified cross-connections and also any existing cross-connections of which the Owner is aware but has not been found by the WWD.
- viii. The Owner shall not install a bypass around any backflow preventer unless there is a backflow preventer of the same type on the bypass. Owners who cannot shut down operation for testing of the device(s) must supply additional devices necessary to allow testing to take place.
- ix. The Owner shall only install backflow preventers meeting or exceeding the standards approved by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California (FCCCHR-USC) and/or the American Society of Sanitary Engineers (ASSE) and/or American Water Works Association (AWWA).
- x. Any Owner having a private well or other private water source will be required to install a High Hazard backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the WWD's system.
- xi. For dual water sources, the potable water distribution system of any building or premises must be connected to a public water supply when available. In the event that a building or premises is serviced by both a public supply and a private water source over which the public water supply system officials do not have sanitary control (i.e. between

municipal water and a private well or a reclaimed or recycled water system), direct cross-connections between the two supplies are prohibited. An air gap between the systems shall be maintained at all times. In no event shall the private source supply the distribution system served by the public water supply. All dual-source facilities will be considered a high hazard and have the appropriate backflow preventer installed at the service connection.

- xii. All new residential buildings will be required to install a residential dual check device immediately downstream of the water meter. Installation of this residential dual check device on a retrofit basis on existing service lines will be instituted at a time and at a potential cost to the Owner as deemed necessary by the WWD. The Owner must be aware that installation of a residential dual check valve results in a potential closed plumbing system within his/her residence. As such, provisions may have to be made by the Owner to provide for thermal expansion within his/her closed loop system (i.e., the installation of thermal expansion devices and/or pressure relief valves). For purposes of the cross connection program 6 (six) residential units or less will be considered residential property (excluding mixed use properties). The installation of backflow preventer shall not be made a mandatory condition of a transfer of a residential property constructed prior to July 2, 2007.
- xiii. In the event the Owner installs plumbing to provide potable water for domestic purposes which is on the influent side of the backflow preventer, such plumbing must have its own backflow preventer installed.
- xiv. All containment backflow preventer assemblies shall be lead free. All internal backflow preventer assemblies used for portable water for human consumption shall be lead free.
- xv. The Owner shall be responsible for the annual testing and retesting, in the case that the device fails to operate correctly, in compliance with WWD or RIDOH requirements. The owner will correct any malfunction of the backflow preventer which is revealed by periodic testing.
- xvi. The Owner shall not bypass, make inoperative, remove, or otherwise make ineffective, any Backflow Preventer without specific authorization of the WWD. Owner shall inform the WWD of any new, potential, proposed or modified cross-connection.

V. Quality Assurance and Control:

- a. WWD reserves the right to disqualify backflow prevention test kits by manufacturer.
- b. Test kits will be calibrated annually or by manufacturer's specifications, whichever is the minimum.
- c. Test kits will be calibrated Point Calibration traceable to NIST.
- d. Documentation of NEWWA and/or ABPA Backflow Prevention Inspector/Tester Certification will be submitted to the WWD.
- e. Documentation of test kit type and periodic calibrations will be submitted to WWD.
- f. Backflow test reports will consist of:
 - i. Leak tightness test of check valve one (1)
 - ii. Leak tightness test of check valve two (2)
 - iii. Leak tightness test of the number two (2) shutoff valve (downstream valve of the assembly)
 - iv. Relief valve opening test where applicable
 - v. Test readings of PSID (pounds per square inch differential) submitted to WWD
- g. There will be a five (5) day maximum for submission of completed Backflow Test Report to WWD.

VI. Responses: In the event of a backflow incident the following procedures will apply:

- a. Identify Source of Backflow:
 - i. In response to water quality complaints, the WWD will collect water samples as necessary to determine water quality in the facility, as well as the water at the service entrance prior to the isolation of the backflow. The WWD will review water system records to verify if changes in operating pressures, consumption patterns, scheduled distribution system repairs, fire hydrant use, fire flow testing or hydrant flushing has taken place. The WWD will determine whether the source of the backflow is the Owner's internal plumbing and/or the City's distribution system and trace

the Owner's water lines to find the source of a potential backflow issue within the Owner's premises.

b. Isolate Source of Backflow:

- ii. The WWD will trace the source of the backflow, identify the nature of the backflow (chemical, biological or other hazards), isolate the source, determine the extent of the contamination and determine if the contamination is restricted to one area of the customer's facility or if the entire facility is affected. Multiple water samples will, as necessary, be taken before any system or on-site flushing is performed to identify the affected areas.

c. Determine Extent/Severity of Backflow:

- i. The WWD will inform the Owner of any backflow within the Owner's internal plumbing system and inform him/her of proper changes to the plumbing system to be made by him/her. The WWD will determine if contamination has backflowed into the distribution system or the source of the on-site contamination is coming from the distribution system. Water sampling will be taken in the distribution system to the extent necessary for the isolation of any backflow. Identifying that the contamination has reached the distribution system means that all customers on that distribution system may be affected. The WWD will isolate that portion of the distribution system which may have been affected by the contamination.

d. Notification:

- i. In the event public notification of a confirmed backflow in the City's distribution system is deemed necessary it will be conducted by any one or all of the following: an automated phone system, door to door contact, flyers, newspapers, radio, television or any appropriate means. A confirmed backflow contained in the Owner's premises will result in proper notification to all occupants/employees and any occupants/employees will be instructed not to use the water. The Owner may make the decision for all occupants/employees to leave the facilities/building.

e. Clean System:

- i. The WWD will isolate and unidirectional flush the affected distributing system for the safe discharging of contaminated water from the distribution system. The Owner will be responsible for cleaning the internal plumbing downstream of the service entrance and discharging the contaminated water in a safe manner.

f. Backflow Preventer Installation:

- ii. The WWD will require the installation of the appropriate backflow protection, as well as the acceptable initial field test of the assembly before returning service to the Owner. If the backflow is confirmed as being contained to the Owner's premises, the Owner will need to take any action necessary to shut off the water, any equipment using the water, eliminate or provide adequate backflow protection of the cross-connection hazard and clean the internal plumbing system.
- iii. Other authorities having jurisdiction (i.e. health agencies, plumbing code enforcement agencies, etc.) will be responsible for ensuring that the internal plumbing system is corrected and properly inspected for compliance.

- g. Documentation: A full report documenting all actions taken during the investigation of a cross connection hazard will be compiled in writing by the WWD. The WWD will review all actions taken; noting lessons learned during any investigated actions that will help with any future backflow event.