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## **Cross Connection Control Program**

**August 24, 2012**

*A Program to Protect Public Health by Controlling Cross Connections  
in the City of Salem Water Distribution System*

For technical inquiries regarding this requirements of this program, please contact:

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## I. PURPOSE

- A. To protect the potable water supply served by the Salem Department of Public Works from the possibility of contamination or pollution by isolating, within its customers' internal distribution system, such contaminants or pollutants which could backflow or back-siphon into the public water system.
- B. To promote the elimination or control of existing cross connections, actual or potential, between its customer's in-plant potable water systems.
- C. To provide for the maintenance of a continuing program of cross connection control which will effectively prevent the contamination or pollution of all potable water systems by cross connections.

## II. AUTHORITY

- A. The Federal Safe Drinking Water Act of 1974, and the Commonwealth of Massachusetts Department of Environmental Protection Drinking Water Regulations of Massachusetts, Section 22, Cross Connections, 310 CMR 22.22, require the protection of sources of water from unapproved sources or any other substances from entering the public potable water system.
- B. City of Salem Code of Ordinances, Section 46-76. Cross connection charges.

## III. RESPONSIBILITY

- A. The City of Salem City Engineer (City) shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants through the water service connections. If, in the judgment of the City, an approved backflow device is required at the City's water service connection to any customer's premises, the City or its delegate agent, shall give notice in writing to said customer to install an approved backflow prevention device at each service connection to the premises. The Owner shall allow his property to be inspected for possible cross connections and shall follow the provisions of the City's program and the Mass DEP's regulations. The Owner shall; typically within 30 days, unless that time is shortened by the City depending on the degree of hazard; install such approved device or devices. Devices shall be installed at the Owners expense, and failure or refusal or inability on the part of the customer to install said device or devices within a specified time frame shall constitute grounds for discontinuing water service to the premises until such device or devices have been properly installed.
- B. The City shall not permit a cross connection within the public water supply system unless it is considered necessary and that it cannot be eliminated.

## IV. DEFINITIONS

A. APPROVED: Accepted by the City of Salem City Engineer as meeting an applicable specification stated or cited in this regulation or as suitable for the proposed use.

B. AUXILIARY WATER SYSTEM: Any water supply on or available to the premises other than the purveyor's approved public potable water supply.

C. BACKFLOW: The flow of water or other liquids, mixtures or substances under pressure into the distribution pipes of a potable water supply system from any source other than its intended source.

D. BACKFLOW PREVENTER: A device or means designed to prevent backflow or back-siphonage. Most commonly categorized as DCVA, PV, or RPZ devices, defined as follows:

1. DOUBLE CHECK VALVE ASSEMBLY (DCVA): An assembly of two independently operating spring loaded check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

2. PRESSURE VACUUM BREAKER SYSTEM (PV): A device containing one or two independently operating spring-loaded check valves and an independently operated spring-loaded air inlet valve located on the discharge side of the check or checks. Device includes tightly closing shut-off valves on each side of the check valves and properly located test cocks for testing of the check valve(s).

3. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER (RPZ): An assembly consisting of two independently operating approved check valves with an automatically operating differential relief valve located between the two check valves, tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of check valves and the relief valve.

E. BACKPRESSURE: A condition in which the Owner's system pressure is greater than the supply system pressure.

F. BACK-SIPHONAGE: 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 system.

G. CITY: The City of Salem, City Engineer, or his/her designee.

H. CONTAINMENT: A method of backflow prevention which requires a backflow prevention device at the water service entrance.

I. CONTAMINANT: A substance that will impair the quality of 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. MASS DEP: The Commonwealth of Massachusetts Department of Environmental Protection.

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 a water service location.

M. OWNER: Any person who has legal title to property upon which a cross connection inspection is to be made or upon which a cross connection is present.

N. PERSON: Any individual or partnership, company, public or private corporation, political subdivision or agency of the State Department, agency or instrumentality of the United States or any other legal entity.

O. PERMIT: A document issued by the City of Salem Engineering Department which allows the use of a backflow preventer.

P. POLLUTANT: A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute 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 effect such water for domestic use.

Q. WATER SERVICE ENTRANCE: That point in the owner's water system beyond the sanitary control of the City, generally considered to be the point of connection to the City water main.

## V. ADMINISTRATION

A. The City will operate a cross connection control program, to include the keeping of necessary records, which fulfills the requirements of the Massachusetts Department of Environmental Protection's Cross Connection Regulations and is approved by the Department.

B. The Owner shall allow his property to be inspected for possible cross connections and shall follow the provisions of the City's program and the Department's regulations.

C. If the City requires the public water supply to be protected by containment, the owner shall be responsible for water quality beyond the outlet end of the containment device and should utilize fixture outlet protection for that purpose.

## VI. PROGRAM

## A. NEW OR REMODELED FACILITIES

1. Any new or remodeled facility shall be subject to the attached Requirements for the Installation of a Backflow Device or Requirements for New or Re-Use Construction. On new installations, or existing installations wherein the use of the building is proposed to change, the Owner will provide, as part of the building permit application process, an evaluation by a certified consultants that determines the need for a new, or appropriateness of the existing, backflow preventer. If any change is required (new or modified device), the owner shall submit plans depicting said change, prepared by a certified consultant, for approval by the Engineering Department for compliance with these regulations. Prior to signing off on the Certification of Occupancy, the Engineering Department shall inspect, test, approve and issue a permit for said device.
2. Upon approval of the device, the City shall issue a permit, on City of Salem Letterhead, for the backflow prevention device.

## B. EXISTING FACILITY SURVEYS

1. The City shall have cross connection surveys, performed by Mass DEP certified cross connection surveyors, of all commercial, industrial, institutional and municipal facilities that have connections to the City water system.
2. Surveys shall be performed in accordance with Mass DEP regulations. A list of all facilities to be surveyed is included in Appendix A.
3. On an annual basis, the City of Salem shall review the current Assessors database of properties in the City for land use changes and identify any new facilities requiring surveys. Any facilities identified shall be surveyed within the first 3 months of the year.
4. As a result of the survey, the City will determine, and inform the Owner of, the appropriateness of the existing, or need for new or modified, backflow prevention device. The Owner will take immediate action to install or modify the device. Typically 30 days will be allowed by the City to make required changes; however, that time may be shortened by the City depending on the degree of hazard involved.
5. At the completion any required changes, or upon completion of a satisfactory survey (no changes needed), the City shall issue a permit for the backflow prevention device.

## C. EXISTING BACKFLOW PREVENTION DEVICES

1. Any existing backflow preventer shall be allowed by the City to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present backflow preventer or results in 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.

2. A list of the existing backflow preventer devices requiring inspection and testing is included in Appendix A.

#### D. PERIODIC TESTING OF EXISTING COMMERCIAL, INDUSTRIAL, INSTITUTIONAL AND MUNICIPAL BACKFLOW PREVENTION DEVICES

1. Reduced pressure principle backflow devices (RPZ's) shall be inspected and tested at least semi-annually by the City, but not sooner than within 5 months after the first inspection. Double check valve assembly (DCVA's) and pressure vacuum breaker (PV's) devices shall be inspected and tested annually. In cases where the City feels that due to the degree of hazard involved, additional testing is warranted, Backflow prevention devices will be tested more frequently. Costs of the annual test and additional tests will be borne by the Owner.
2. Periodic testing shall be performed by the City's Mass DEP certified tester or its delegated representative who shall be a Mass DEP certified tester.
3. The testing shall be conducted during the City's regular business hours. Exceptions to this, when at the request of the Owner, may require additional charge to cover the increased costs to the City.
4. Any backflow preventer which fails during a periodic test will be immediately repaired or replaced, typically within 30 days, unless that time is shortened by the City depending on the degree of hazard, at the Owner's expense. When repairs are necessary, upon completion of the repair, the device will be re-tested at the Owner's expense to insure 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 fourteen calendar 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 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.

### VII. RESPONSIBILITIES

#### A. CITY OF SALEM

1. The City will issue permits for all backflow prevention devices.
2. The City will not allow any cross connection to remain unless it is protected by an approved backflow preventer for which a permit has been issued and which will be regularly tested to insure satisfactory operation.
3. The City shall inform the Owner, by letter, of any failure to comply by these regulations. In the event that the Owner fails to comply with the necessary corrective action, the City will inform the Owner, by letter, that the water service to the Owner's premises will be terminated within a period not to exceed five days. In the event that the Owner informs the City that extenuating circumstances, as to why the correction

has not been made, a time extension may be granted by the City, but in no case will exceed an additional thirty calendar days.

4. If the City determines at any time that a serious threat to the public health exists, the water service will be terminated immediately.

5. The City shall have on its staff, or shall have a delegated representative, who is a Mass DEP certified backflow device tester.

6. The City will have inspections of premises initiated to determine the nature of existing potential hazards, in accordance with 310 CMR 22.22.

B. OWNER

1. The Owner shall be responsible for allowing the premises to be inspected by the City, and shall be responsible for the elimination or protection of all cross connections on his premises. If access is denied by the Owner, the City shall consider the test failed and notify the Owner accordingly.

2. The Owner, after having been informed by letter from the City, shall, at his expense, install, maintain and pay for any required testing, any and all backflow preventers on his premises.

3. The Owner shall correct any malfunction of the backflow preventer which is revealed by periodic testing.

4. The Owner shall inform the City 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 City.

5. 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.

6. The Owner shall install backflow preventers in a manner approved by the City.

7. The Owner shall install only backflow preventers approved by the City.

8. Residential private wells or other private water sources cannot be connected to the City System. Any other owner having a private well or other private water source must have a permit if the well or source is cross connected to the City system. Permission to cross connect may be denied by the City. The Owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not connected to the City's system.

9. In the event the Owner installs plumbing to provide potable water for domestic purposes which is on the supply side of the backflow preventer, such plumbing must have its own backflow preventer installed, if required.

10. The Owner shall be responsible for the payment of all fees for permits, site inspections, device testing, re-testing in the case that the device fails to operate correctly, and second re-inspections for non-compliance with City requirements.

11. It shall be the property owner's responsibility (not part of this program) to properly install and test cross connection systems for residential fire protection systems and residential lawn irrigation systems to remain in compliance with 310 CMR 22.22.

#### VIII. DEGREE OF HAZARD

A. The City recognizes the threat to the public water system arising from cross connections. All threats will be classified as high hazard and will require the installation of approved reduced pressure principle backflow prevention devices. Hazard designations have been provided for each facility in the Facility Summary provided in Appendix A. The City shall update this list on an annual basis, based on the results of its survey program.

#### IX. NOTIFICATIONS

A. On an annual basis, the City shall provide notification to consumers and public officials of the requirements of the distribution system cross connection control program, including the Mayor, City Council, Fire Chief, Health Department, Plumbing and Building inspectors, and Local State Representative. Notification shall be made in the Annual Consumer Confidence Report for Salem water customers, created by the Salem Beverly Water Supply Board.

B. The Engineering Department shall prepare and post the notification on its website for consumers, and distribute it to the Mayor, City Council, Fire Chief, Health Department, Plumbing and Building inspectors by interoffice mail. US Mail will be used to distribute the notification to the Local State Representative.

#### X. RESIDENTIAL PROGRAM

A. The City shall establish a residential backflow education program, to be administered by the City Engineering Department, for residential users which shall include bill inserts, website information, etc., that addresses hose bib applications and the need for inspection and testing of residential backflow preventers.

B. The program will be implemented by the Fall of 2012.

#### XI. FEES

A. The City shall assess a \$100 fee for each backflow device inspected and tested.



XII. RECORDS AND REPORTS

A. RECORDS

1. The City Engineering Department will initiate and maintain the following:
  - a) Master files on customer cross connection tests and/or inspections.
  - b) Copies of permits and permit applications.
  - c) Copies of lists and summaries supplied to the Mass

XIII. VIOLATION OF THIS PROGRAM

- A. No person or corporation shall directly or knowingly permit an employee, agent or servant to violate any of the provisions of this program.

**APPENDIX A  
BACKFLOW DEVICE FACILITY SUMMARY**

**APPENDIX B  
STANDARD FORMS**

**ATTACHMENTS:**  
**Cross Connection Control Program**  
*Requirements New or Re-Use Construction*  
August 24, 2012

**Cross Connection Control Program**  
*Requirements for the Installation of a Backflow Device*  
August 22, 2012