

CROSS - CONNECTION CONTROL PROGRAM

BELFAST WATER DISTRICT

BELFAST, MAINE 04915

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BELFAST WATER DISTRICT

CROSS CONNECTION CONTROL PROGRAM

I. SUMMARY

Cross-connections between water supplies and non-potable sources of contamination represent one of the most significant threats to health in the water supply industry. This program is designed, therefore, to maintain the safety and potability of the water in the Public Water Distribution System of the Belfast Water District by preventing the contamination of the drinking water by the backflow of water or other liquids, gases, mixtures, compounds or other substances, other than water from the intended source.

II. AUTHORITY

This program derives its enforceability from Title 22, M.R.S.A., C-601, Sub-chapter 2, Section 2612(5), Maine Department of Human Services, Cross Connection Rules 10-144A CMR 226. In addition, authority arises from provisions in the State of Maine Plumbing Code, Occupational Safety and Health Act, as well as from the Terms and Conditions as published by the Belfast Water District and as approved by the Maine Public Utilities Commission.

III. DEFINITIONS

- a. Anti-Backflow Device - A device or means to prevent backflow.
- b. Approved Source
A source of water utilized by a public water system for distribution to the public for consumption or other purposes and which is approved by the Department of Human Services for said use following an approved treatment process, if any, required by the Department.
- c. Backflow
The flow of water or other foreign liquids, gases, mixtures, compounds or other substances into the public water distribution system from any source other than the intended.
- d. Backflow Preventer - A device or means to prevent backflow, sub-defined as follows:
 1. Air gap - A physical separation sufficient to prevent backflow between the free flowing discharge end of the potable water system and any other system.

2. **Atmospheric Vacuum Breaker** - A device, which prevents back siphonage by creating an atmospheric vent where there is either a negative pressure or a sub-atmospheric pressure in a water system.
3. **Backflow Preventer with Intermediate Atmospheric Vent** - A device having two check valves separated by an atmospheric vent.
4. **Double Check Valve Assembly** - A device having two spring-loaded bronze faced check valves with soft rubber discs with shutoff valves and test cocks for periodic testing.
5. **Hose Bib Vacuum Breaker** - A device that is permanently attached to a hose bib and which acts as an atmospheric vacuum breaker.
6. **Pressure Vacuum Breaker** - A device containing a spring loaded check valve and a spring-loaded atmospheric vent, which opens when the pressure approaches atmospheric. It contains valves and fittings, which allow for periodic testing.
7. **Reduced Pressure Principle Backflow Preventer** - An assembly of check valves and a reduced pressure zone, which spills water to the atmosphere in the event of failure of the check valves. It has valves and fittings, which allow for periodic testing.
8. **Residential Dual Check Valve** - An assembly of two independently acting check valves used primarily on residential and low-hazard services.

e. **Back Pressure**

A condition where the owner's system pressure is greater than the supplier's system pressure, causing a reversal of the normal direction of flow.

f. **Back-Siphonage**

Backflow resulting from a negative or less than atmospheric pressure in the distribution pipes of a public water supply system.

g. **Containment**

A method of backflow prevention, which requires a backflow preventer at the water service entrance.

h. Cross-Connection

Any physical connection or structural arrangement between two (2) otherwise separate systems, one of which contains potable water and the other which contains water of unknown or questionable safety and/or steam, chemicals, gases or other containments and/or pollutants, whereby there may be a flow of unapproved water to a potable water supply.

i. **Department** - State of Maine, Department of Human Services

j. Fixture Isolation

A method of backflow prevention in which a backflow preventer is located to prevent a cross-connection at an in-plant unit rather than at the water service entrance.

k. Owner

Any individual, tenant, corporation, political body or sub-division or any other entity who has legal title to operate or habitate in a property upon which a cross-connection is present.

l. Permit

A document issued by the Department with the approval of the Supplier, which allows the use of a backflow preventer.

m. Person

Any individual, partnership, company, public or private corporation, political sub-division or agency of the State, department, or agency or instrumentality of the United States or any other legal entity.

n. Potable Water

Approved water, free from impurities present in any amount sufficient to cause disease or harmful physiological effects. Its physical, chemical, bacteriological and radiological quality conforms to the Maine State Drinking Water Act, or any regulations pertaining thereto.

o. Private Water Source

Any source of water which may or may not be approved by the Department, utilized by any Owner for consumptive and/or other purposes, and which is not under the immediate control of the Supplier.

p. Public Water System

Any publicly or privately owned system of pipes, structures, and facilities through which potable water is sold, furnished or distributed to the public for human consumption, and which is under the control of the Supplier. The system shall not include the portion of service pipe owned and maintained by the Owner.

- q. **Supplier** – ***THE BELFAST WATER DISTRICT*** who controls, owns, or generally manages the system of pipes, structures and facilities through which water is delivered for human consumption.
- r. **Water Service Entrance**
That point at which the Owners water supply system is beyond sanitary control of the Supplier. This will ordinarily be the outlet end of the water meter and will always be before any unprotected branch line.

IV. ADMINISTRATION

- 1. The Supplier shall develop and operate a cross-connection control program, including keeping necessary records, which fulfills the requirements of the Department's Cross-Connection Rules and is approved by the Department.
- 2. The Owner shall allow his property to be inspected for possible cross-connections and shall follow the provisions of this program or the Department's Cross-Connection Rules if a cross-connection is permitted.
- 3. If the Supplier requires that the public supply be protected by containment, the Owner shall be responsible for water quality beyond the outlet end of the containment device.
- 4. Both the Supplier and the Owner shall attempt to eliminate all cross-connections.

V. RESPONSIBILITY

a. SUPPLIER'S RESPONSIBILITY

- 1. The Supplier's inspection for all cross-connections or potential cross-connections shall be during normal working hours unless otherwise arranged with the Owner.
- 2. The Supplier will, after the initial inspection of the Owner's premises, inform the Owner by letter of any correction(s) and the time allowed for the correction(s), which will not be in excess of fourteen (14) days. At the end of the allowed time, a re-inspection will be conducted.
- 3. The Supplier 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 is regularly tested and operates satisfactorily.

*****NOTE: Certain fixtures are exempted from this provision and are listed in Section VIII.**

4. The Supplier shall inform the Owner by letter of any failure of compliance by the time of the first re-inspection. The Supplier will allow a maximum extension of one (1) calendar week for the correction to be made. If there is a failure to comply by the date of the second re-inspection, service termination will take place in accordance with the Supplier's Terms and Conditions for non-payment.
5. If the Supplier determines at any time that a serious threat to the public health exists, service shall be terminated immediately as allowed by Maine Public Utilities Commission, Chapter 81 Section 7 (A)(8).
6. Re-establishment of service before the installation of a backflow preventer may be allowed by the Supplier, **ONLY** after the Supplier determines that no immediate threat to the public health exists and an agreement between the Supplier, the Owner, and/or the Department has been made indicating the intention of the Owner to comply and a compliance schedule is set up.
7. The Supplier shall conduct an inspection and re-inspection program, which covers all industrial customers every three (3) years and all commercial customers every five (5) years. Residential customers shall be inspected as deemed necessary.
8. The Supplier shall ensure all new construction, including residential, complies with this program.
9. The Supplier shall inspect dwellings with more than four units and require that they comply with this program. Also, the Supplier shall inform the Owner of the dwelling with four or less units of potential hazards of cross-connections, giving examples of possible backflow situations. The Owner of any dwelling residence, institution or business shall be required to install a backflow preventer in accordance with this program.
10. The Supplier shall be responsible for the administration of this program and for ensuring that periodic testing of all backflow preventers are performed, as required in the permit.

b. OWNER'S RESPONSIBILITY

1. The Owner, after being informed by a letter from the Supplier shall, at his expense, install, maintain, and ensure the testing of any backflow preventer deemed necessary on his premises. The Owner is responsible for the provision of replacement or repair parts and should have a supply on hand.

2. The Owner shall correct any malfunction of the backflow preventer, which is revealed by periodic testing (see Page 9, Section IX, Paragraph 2). This includes the replacement of parts or of the backflow preventer if deemed necessary by the Supplier or the Department. Failure to comply with testing, repairing, or replacement requirements will result in termination of service, according to the District's Rules and Regulations for non-payment.
3. The Owner shall inform the Supplier by letter of any new or modified cross-connections and also of any existing cross-connections of which the Owner is aware but have not been found by the Supplier's inspections.
4. Any Owner having a plumbed private water source within the building or establishment shall have a reduced pressure principle device installed whether or not the private source is cross-connected to the Supplier's system. Permission may be denied to cross-connect by the Supplier or the Department.
5. The Owner shall not install a by-pass around any backflow preventer unless there is a backflow preventer on the by-pass. Owners who cannot shut down operation for testing must provide additional backflow preventers to allow for the periodic testing of each device.
6. The Owner shall only install backflow preventers listed or approved by the Supplier and the Department.
7. The Owner shall install the backflow preventer in a manner approved by the Manufacturer, Supplier and/or the Department.
8. If the Owner installs plumbing to provide potable water for domestic purposes, on the Supplier's side of a backflow preventer, said plumbing must also have a backflow preventer.

VI. DEGREE OF HAZARD

Different types of cross-connections constitute different degrees of hazard which are classified as follows, listed with the approved types of devices:

1. Class I – Low Degree of Hazard

If backflow were to occur, the resulting health significance would be limited to minor changes in the esthetic quality such as taste, odor, or color. The foreign substance must be non-toxic and non-bacteria in nature and have no significant health effect. Allowed devices are air gap, non-pressure type vacuum breaker, pressure type vacuum breaker, testable double check valve assembly, or reduced pressure principle device.

2. Class II – Moderate Degree of Hazard

If backflow were to occur, the resulting effect on the water supply would be significant changes in esthetic qualities. The foreign substance must be non-toxic and non-bacterial in nature. Allowed devices are air gap, pressure type vacuum breaker, testable double check valve assembly, or reduced pressure principle device.

3. Class III – High Degree of Hazard

If backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans either from a chemical, bacteriological or radiological standpoint and may result from either long or short-term exposure. Allowed device is a reduced pressure principle device.

- a. Class III hazards can be protected against by containment or fixture isolation. Examples of establishments which will be controlled by containment are:
 - 1. Wastewater Installations
 - i. Treatment plants
 - ii. Pump stations including storm water pump stations
 - iii. Industrial waste treatment plants
 - 2. Industries where a health hazard exists.
 - 3. Hospitals, nursing homes, clinics, etc.
 - 4. Vessel watering points or fixtures.
 - 5. Tank trucks, street sweepers, and other similar units, which receive water at the Supplier's shop or any of its hydrants.

- b. Examples of establishments which the Supplier may cause to be controlled by either containment or fixture isolation are:
 - 1. Laboratories
 - 2. Mortuaries or Funeral Homes
 - 3. High pressure boilers
 - 4. Chemically treated low pressure boilers
 - 5. Lawn irrigation systems
 - 6. Swimming pools
 - 7. Car wash facilities
 - 8. Farms where water is used for other than domestic purposes.
 - 9. Commercial installations with very small industrial functions.

VII. PERMITS

- 1. Permits will be issued by the Department upon recommendation of the Supplier for any backflow situation except those listed as exemptions in Section VIII, Part 3.

- 2. Permits will be issued only if the cross-connection is deemed necessary and cannot be eliminated.

3. The Supplier shall determine the degree of hazard, testing frequency; type, size, make, and model of backflow preventer and any exemptions shall be listed on the permit. If more than one (1) device is used to protect a single cross-connection, it shall all be listed on the permit. Permits are non-transferable and shall be renewed every five (5) years.
4. The Owner shall apply for a permit on appropriate forms to be provided by the Supplier, and shall submit said application to the Supplier in triplicate along with any sketches or plans required by the Supplier.
5. The Supplier shall forward one copy of the permit application to the Department along with recommendations as to whether or not the permit should be issued.
6. Any change in the degree of hazard or replacement of the device will require a new permit.
7. The Owner shall follow the provisions of the Belfast Water District's program and the Department of Human Services Rules regarding cross-connections if a permit is issued.

VIII. EXEMPTIONS

1. Any cross-connection protected against backflow at the time this program becomes effective may continue with the same protection unless:
 - a. The Supplier or the Department deems the existing protection inadequate.
 - b. The Department notifies the Supplier, in writing, that a change must be made.
2. The exemption will expire at any time that the backflow preventer must be replaced. In such cases, the replacement backflow preventer must be of the type required by the degree of hazard.
3. Certain fixtures, which constitute cross-connections, may be controlled by non-testable backflow preventers and will not require a permit. Examples of these fixtures are as follows:
 - i. Hose bibs, which are only potential cross-connections.
 - ii. Below the rim outlets which can be replaced by a gooseneck device.
 - iii. Toilets with anti-siphon ball cocks.
 - iv. Any fixture with a built-in atmospheric vacuum breaker, which cannot be bypassed.
 - v. Others as listed in Appendix A of the State of Maine Cross Connection Rules

IX. PERIODIC TESTING

It is recognized that any backflow preventer can fail and any method of protection can be subverted; thus, periodic testing, depending upon the degree of hazard and inspection, is necessary. This includes all types of backflow prevention, therefore:

1. Testing shall be performed once every 12 months, unless otherwise determined and stated on the permit, by a person who has been certified for testing backflow devices by the New England Water Works Association or the American Backflow Prevention Association and approved by the Belfast Water District. The cost of such testing shall be at the expense of the Owner.
2. **Any backflow preventer, which fails during any test, shall be immediately repaired and the Supplier must be notified.** Any delay or repair for more than four (4) days requires termination of service or some other means to ensure the protection of the public water system and the safety of the public health. *The device is to be retested after repairs and must result in a PASSED TEST. The Supplier may require the device to be retested again in six (6) months before it can revert to testing on a yearly basis.*
3. Certain situations with a Class II or Class III degree of hazard will not be allowed to continue unprotected if the backflow preventer fails and cannot be immediately repaired.

***** NOTE: It is re-emphasized that in order to minimize down time, the Owner is responsible for the provision of replacement or repair parts and should have a supply on hand.**

X. INSTALLATIONS

1. The Owner after being informed by written notice from the District shall, at his expense, install an approved backflow preventer on his premises.
2. If a by-pass is necessary because the water service cannot be interrupted, a backflow preventer of the same rating shall protect the by-pass.
3. The Owner shall install only backflow preventers listed and approved by the Department and the District.
4. The manner of installation shall be according to manufacturer's specifications and approved by the District.
5. Pit installations are strongly discouraged and must have Departmental approval before a permit is issued.

6. If the District requires the supply to be protected by containment, the Owner shall install the backflow preventer as close as possible to the meter and shall be responsible for the water quality beyond the outlet end of the device.
7. Installation of devices should allow for peak demand, fire flows, and equipment that will require stand-by supply. Consideration should be given as to whether the device will be subject to hot water.

XI. RESIDENTIAL SERVICES

All new Residential service connections shall have a State approved dual check backflow preventer installed on the service line before water service is turned on. A backflow preventer will ordinarily be installed at the outlet end of the water meter and will always be before any unprotected branch line and before any pump. All existing Residential Services shall be required to have a state approved dual check backflow preventer installed. Any Residential Service may be required to have a testable backflow preventer installed if deemed necessary by a District inspection.

XII. COMMERCIAL AND INDUSTRIAL SERVICES

All Commercial and Industrial establishments shall have a State approved backflow preventer installed on the service line before water service is turned on. A backflow preventer will ordinarily be installed at the outlet end of the meter and will always be before any unprotected branch line and before any pump. The type of device shall be determined by the actual or potential degree of hazard.

XIII. FIRE PROTECTION SERVICE LINES

New service lines with direct connection from the utilities water mains only, and having no pumps, tank, or reservoirs and without any physical connection from other water supplies and not having anti-freeze or other additives and all sprinkler drains discharging to atmosphere shall have a State approved inline testable double check valve assembly installed on the service line and before any unprotected branch line.

New service lines with direct connection from the utilities water mains and having one or all of the following: elevated storage tanks, fire pumps taking suction from above ground covered reservoirs or tanks and provided these storage facilities are filled with public water only and that the water in the tanks are kept in a potable condition shall have a State approved testable double check valve assembly installed on the service line that is connected to the utilities water main and before any unprotected branch line, and before any pump.

New service lines with direct connection from the utilities water mains and interconnected with auxiliary supplies, such as, pumps taking suctions from rivers, ponds, wells, or reservoirs exposed to contamination, or where antifreeze is added and other industrial water systems shall have a State approved reduced pressure zone principal backflow preventer installed in such a manner as to protect the public water system.

In such instances where protection of the public water supply is needed from fire protection service lines; and such requirements are not included in the above, the Utility will assess the degree of protection required. If any modification or renewals to an existing sprinkler system is made, than at that time an appropriate State approved inline testable backflow preventer shall be installed. **The Owner shall be responsible for any system redesigning that will be required to insure adequate flows for fire protection.**

***NOTE: Fire lines shall not have strainers installed before the Backflow Preventer.

XIV. 13D and LIFE SAFETY SYSTEMS

If the customer's domestic supply line is used without a separate branch line for the sprinkler heads, then a State approved double check valve assembly shall be installed after the meter and before any unprotected branch line.

If a branch line is used to service the sprinkler heads only, and is dead-ended, then a State approved double check valve assembly shall be installed on the branch line.

XV. COMPLIANCE

Failure to comply with these regulations either by neglect to complete the application, procure or install the proper device or repair a malfunctioning device may lead to termination of service.

1. Installation of Backflow Device

a. *First Notice*

Shall be the letter of inspection allowing fourteen (14) days to comply.

b. *Second AND Final Notice*

The District shall inform the owner by written notice of any failure to comply with the first notice and be given an additional (7) days to comply. Service termination will take place within ten (10) days following the scheduled disconnection date.

Unless circumstances are beyond the control of the Owner, water service may be allowed before the installation of a backflow preventer, **ONLY** after an agreement with the District, Department and Owner has been made indicating the intention of the Owner to comply and a compliance schedule is set up.

2. Repair of a Malfunctioning Device

A malfunctioning device must be repaired immediately or within four (4) days. The device is to be retested after repairs and result in a **PASSED TEST**. Any delay or repair for more than four (4) days requires termination of service or some other means to ensure the protection of the public water system and the safety of the public health.

XVI. TYPE OF BACKFLOW PREVENTION REQUIRED

State approved backflow prevention device of type specified shall be installed on each domestic service line to the following of facilities.

This list is a guideline and should not be construed as being complete.

<u>Type of Facility</u>	<u>Type of Protection</u>
Auxiliary Water Systems - <u>Connected or not</u>	RP
Barber/Beauty Shop	RP/DC/RDC*
Beverage Bottling Plants	DC
Car Wash	RP
Cemeteries	RP
Chemical Plants	RP
Dairies	DC/RP
Dental Office	RP
Dry Cleaners	RP
Film Laboratory or Processing Plant	RP
Florist Shop with irrigation and plant growth	RP
Florist Shop without irrigation and plant growth	DC/RDC
Food Processing	DC/RP
Gas Stations, pumps only	DC
Garage for equipment and vehicle repair	RP
Hospitals, Clinics, Medical Buildings	RP
Hotels and Motels	RP
Laundries with Dry Cleaning	RP
Laundries without Dry Cleaning	DC
Metal Plating and Processing Plant	RP
Morgues or Mortuaries	RP
Nursing Homes	RP
Petroleum Storage Yard	RP
Piers, Docks, Waterfront Facilities	RP
Print Shops	RP
Restaurants	RP
R.V. Parks and Campgrounds	RP
Sand and Gravel Pits	RP
Single Family Residential	RDC
Sprinkler or Irrigation Systems	RP
Swimming Pools	RP
Sewage Treatment Plant	RP
Sewage Treatment Pumping Stations	RP
Tanneries	RP
Veterinary Establishments	RP

- * DC - Double Check Valve Assembly
- RP - Reduced Pressure Zone Principal Device
- RDC - Residential Dual Check

CROSS CONNECTION CONTROL PROGRAM

BELFAST WATER DISTRICT

285 NORTHPORT AVENUE

BELFAST, ME 04915

Approved by the Belfast Water District Board of Trustees:

Signed: _____ **Date:** _____
 Archie J. Gaul, Chairman

Signed: _____ **Date:** _____
 Fleetwood Pride, Jr., Vice Chairman

Signed: _____ **Date:** _____
 Stephen T. Whitney, Sec./Treas.

Signed: _____ **Date:** _____
 Alton R. Kenney, Trustee

Signed: _____ **Date:** _____
 Stephen J. Hall, Trustee

Signed: _____ **Date:** _____
 Harry T. Smith, Superintendent

Approved by the State of Maine, Department of Human Services

By: _____

Title: _____

Date: _____

