

Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs

# Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker  
Governor

Karyn E. Polito  
Lieutenant Governor

Kathleen A. Theoharides  
Secretary

Martin Suuberg  
Commissioner

November 02, 2020

[Redacted Address]

## MassDEP Cross Connection Certification

Dear KEVIN SCOTT SWAIL

The Department of Environmental Protection, Drinking Water Program (MassDEP - DWP) has reviewed your application for the MassDEP Cross Connection Certification as a **Combination Certification (Backflow Tester & Cross Connection Surveyor)**. We are pleased to inform you that you have been accepted as qualifying for the **Combination Certification (Backflow Tester & Cross Connection Surveyor)** Certification in the Commonwealth of Massachusetts. This certificate letter indicates that you are entitled to inspect and test backflow prevention devices in accordance with the Massachusetts Drinking Water Regulations, 310 CMR 22.22.

Your MassDEP Cross Connection Certificate # is **WS10-0031920** and is valid until **12/1/2023**

An application for the renewal of this certification must be done through the method prescribed in 310 CMR 22.22(12), prior the expiration date stated above.

If you have any questions regarding the MassDEP-DWP Cross Connection Certification Program or the responsibilities of the professional holding this certification, please contact Mr. Otavio DePaula-Santos at 617-292-5500 or via e-mail at [Otavio.Paula-Santos@state.ma.us](mailto:Otavio.Paula-Santos@state.ma.us)

Sincerely

J. Otavio DePaula-Santos, M.S  
Cross Connection Certification Program  
MassDEP - Drinking Water Program

This information is available in alternate format. Call the MassDEP Diversity Office at 617-556-1139. TTY# MassRelay Service 1-800-439-2370  
MassDEP Website: [www.mass.gov/dep](http://www.mass.gov/dep)  
Printed on Recycled Paper



Commonwealth of Massachusetts  
Mass DEP Drinking Water Program  
Cross Connection Control Program

Massachusetts Department of Environmental Protection

### Cross Connection Certification

Hereby issues this certification card to

**KEVIN SCOTT SWAIL**  
as a **Combination Certification (Backflow Tester & Cross Connection Surveyor)**

signature

Certificate ID#	Date Issued	Expiration Date
WS10-0031920	11/2/2020	12/1/2023

# Purpose and Scope

Public health officials have long been concerned about cross-connections and backflow connections in plumbing systems and in public drinking water supply distribution systems. Such cross-connections, which make possible the contamination of potable water, are ever-present dangers. One example of what can happen is an epidemic that occurred in Chicago in 1933. Old, defective, and improperly designed plumbing and fixtures permitted the contamination of drinking water. As a result, 1,409 persons contracted amebic dysentery; there were 98 deaths. This epidemic, and others resulting from contamination introduced into a water supply through improper plumbing, made clear the responsibility of public health officials and water purveyors for exercising control over public water distribution systems and all plumbing systems connected to them. This responsibility includes advising and instructing plumbing installers in the recognition and elimination of cross-connections.

Cross-connections are the links through which it is possible for contaminating materials to enter a potable water supply. The contaminant enters the potable water system when the pressure of the polluted source exceeds the pressure of the potable source. The action may be called backsiphonage or backflow. Essentially it is reversal of the hydraulic gradient that can be produced by a variety of circumstances.

It might be assumed that steps for detecting and eliminating cross-connections would be elementary and obvious. Actually, cross-connections may appear in many subtle forms and in unsuspected places. Reversal of pressure in the water may be freakish and unpredictable. The probability of contamination of drinking water through a cross-connection occurring within a single plumbing system may seem remote; but, considering the multitude of similar systems, the probability is great.

## Why do such cross-connections exist?

First, plumbing is frequently installed by persons who are unaware of the inherent dangers of cross-connections. Second, such connections are made as a simple matter of convenience without regard to the dangerous situation that might be created. And, third, they are made with reliance on inadequate protection such as a single valve or other mechanical device.

To combat the dangers of cross-connections and backflow connections, education in their recognition and prevention is needed. First, plumbing installers must know that hydraulic and pollutional factors may combine to produce a sanitary hazard if a cross-connection is present. Second, they must realize that there are available reliable and simple

standard backflow prevention devices and methods that may be substituted for the convenient but dangerous direct connection. And third, it should be made clear to all that the hazards resulting from direct connections greatly outweigh the convenience gained. This manual does not describe all the cross-connections possible in piping systems. It does attempt to reduce the subject to a statement of the principles involved and to make it clear to the reader that such installations are potentially dangerous. The primary purpose is to define, describe, and illustrate typical cross-connections and to suggest simple methods and devices by which they may be eliminated without interfering with the functions of plumbing or water supply distribution systems.

## Human Blood in the Water System

# Public Health Significance of Cross-Connections

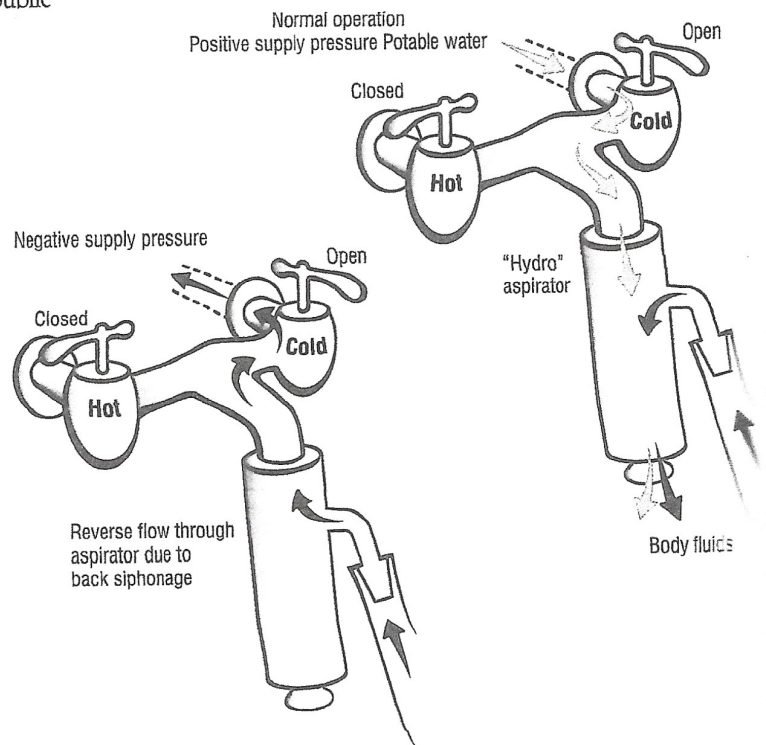
Public health officials have long been aware of the impact that cross-connections play as a threat to the public health. Because plumbing defects are so frequent and the opportunity for contaminants to invade the public drinking water through cross-connections are so general, enteric illnesses caused by drinking water may occur at most any location and at any time.

The following documented cases of cross-connection problems illustrate and emphasize how actual cross-connections have compromised the water quality and the public health.

Health Department officials cut off the water supply to a funeral home located in a large southern city, after it was determined that human blood had contaminated the fresh water supply. City water and plumbing officials said that they did not think that the blood contamination had spread beyond the building, however, inspectors were sent into the neighborhood to check for possible contamination. The chief plumbing inspector had received a telephone call advising that blood was coming from drinking fountains within the building. Plumbing and county health department inspectors went to the scene and found evidence that the blood had been circulating in the water system within the building. They immediately ordered the building cut off from the water system at the meter.

Investigation revealed that the funeral home had been using a hydraulic aspirator to drain fluids from the bodies of human "remains" as part of the embalming process. The aspirator directly connected to the water supply system at a faucet outlet located on a sink in the "preparation" (embalming) room. Water flow through the aspirator created suction that was utilized to draw body fluids through a hose and needle attached to the suction side of the aspirator.

The contamination of the funeral home potable water supply was caused by a combination of low water pressure in conjunction with the simultaneous use of the aspirator. Instead of the body fluids flowing into the sanitary drain, they were drawn in the opposite direction—into the potable water supply of the funeral home!



## Burned in the Shower

A resident of a small town in Alabama, jumped in the shower at 5 a.m. one morning in October, 1986, and when he got out his body was covered with tiny blisters. "The more I rubbed it, the worse it got," the 60 year old resident said. "It looked like someone took a blow torch and singed me."

He and several other residents received medical treatment at the emergency room of the local hospital after the water system was contaminated with sodium hydroxide, a strong caustic solution.

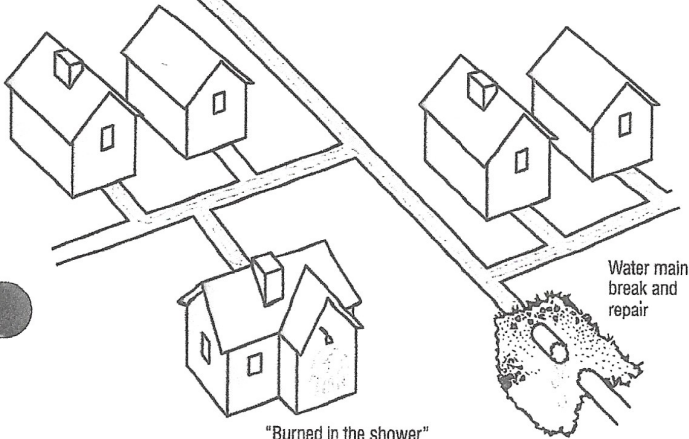
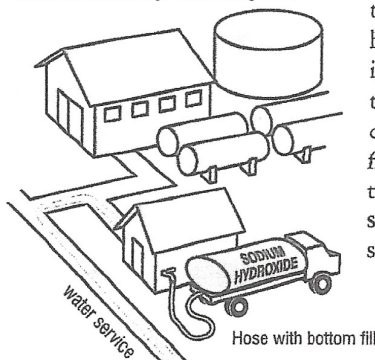
Other residents claimed that, "It (the water) bubbled up and looked like Alka Seltzer. I stuck my hand under the faucet and some blisters came up."

One neighbor's head was covered with blisters after she washed her hair and others complained of burned throats or mouths after drinking the water.

The incident began after an 8-inch water main, that fed the town, broke and was repaired. While repairing the water main, one workman suffered leg burns from a chemical in the water and required medical treatment. Measurements of the pH of the water were as high as 13 in some sections of the pipe.

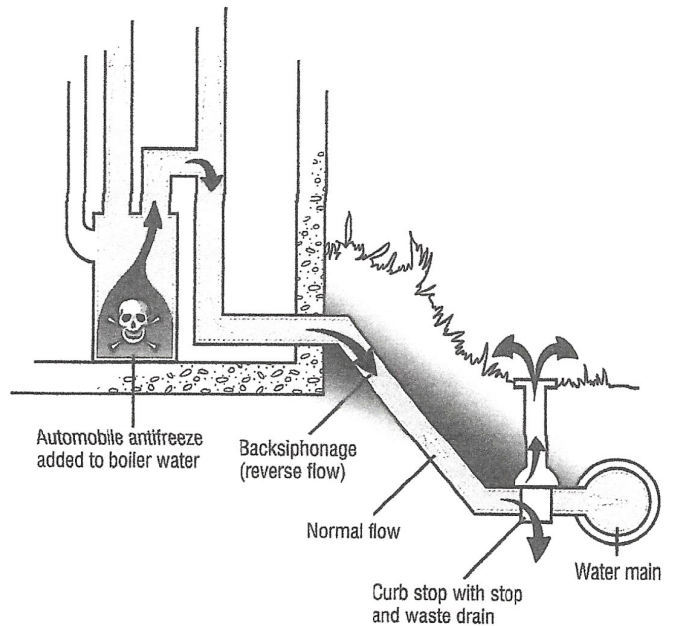
Investigation into the cause of the problem led to a possible source of the contamination from a nearby chemical company that distributes chemicals such as sodium hydroxide. The sodium hydroxide is brought to the plant in liquid form in bulk tanker trucks and is transferred to a holding tank and then pumped into 55 gallon drums. When the water main broke, a truck driver was adding the water from the bottom of the tank truck instead of the top, and sodium hydroxide back-siphoned into the water main.

Chemical bulk storage and holding tanks



## Heating System Anti-Freeze into Potable Water

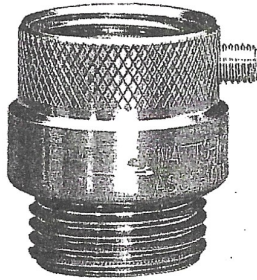
Bangor Maine Water Department employees discovered poisonous antifreeze in a homeowner's heating system and water supply in November, 1981. The incident occurred when they shut off 'the service line to the home to make repairs. With the flow of water to the house cut off, pressure in the lines in the house dropped and the anti-freeze, placed in the heating system to prevent freeze-up of an unused hot water heating system, drained out of the heating system into house water lines, and flowed out to the street. If it had not been noticed, it would have entered the homeowner's drinking water when the water pressure was restored.



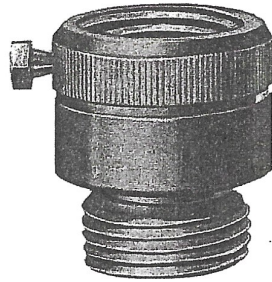
# Series 8

## Hose Connection Vacuum Breakers

Sizes: 3/8" - 3/4" (10 - 20mm)



8



8B



8FR

Series 8 is a line of unique vacuum breakers specially made to permit the attachment of portable hoses to hose thread faucets. Designed to prevent the flow of contaminated water back into the potable water supply, these devices require no plumbing changes, and screw directly onto a sill cock. Series 8 can be used in a wide variety of installations, such as service sinks, swimming pools, photo developing tanks, laundry tubs, wash racks, dairy barns, marinas and general outside gardening uses.

### Materials

- Body: brass (all models except 8P)
- Stainless steel working parts for longevity
- Durable rubber diaphragm and disc for consistent positive seating

### Models

**8\*** - brass body, removable, non-draining

**8A\*** - patented "non-removable" feature, drainable, interlocking spring prevents removal once installed

**8B\*** - brass body, with breakaway set screw to prevent removal, drainable

**8C, 8BC and 8AC** - same as above in chrome finish

**NF8C** - specifically designed for wall and yard hydrants, permits manual draining for freezing conditions. Chrome finish

**8P** - thermoplastic body with patented "non-removable" feature and equipped to allow sill cock to be drained

**S8C** - designed for tub and shower hand spray sets. Chrome finish

**S8** - same as above with plain brass finish

**8FR** - with freeze relief features. Protects the valve from freeze damage with or without the hose attached (Patent Pending)

**Note:** Models 8, 8A and 8B are not suitable for frost-free hydrants. See Model NF8.

### Approvals



ASSE 1011

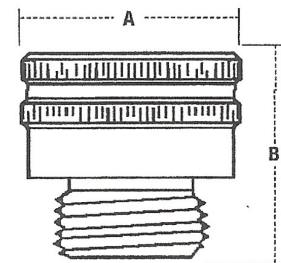
UPC

CSA B64.2

Series 8, 8A, 8B, 8P, 8FR and NF8 are listed by IAPMO

### Dimensions - Weights

MODEL	SIZE (DN)		DIMENSIONS (APPROX.)				WEIGHT	
	in.	mm	A		B		oz.	gm.
8	3/4HT	20	1 1/2	35	1 1/2	38	4	113.4
8A	3/4HT	20	1 1/2	38	1 1/2	38	4	113.4
8AC	3/4HT	20	1 1/2	38	1 1/2	38	4	113.4
8B	3/4HT	20	1 1/2	38	1 3/8	35	4	113.4
8BC	3/4HT	20	1 3/8	35	1 1/2	38	4	113.4
8C	3/4HT	20	1 3/8	35	1 1/2	38	4	113.4
NF8	3/4HT	20	1 1/2	38	2	50	5.3	151.2
NF8C	3/4HT	20	1 1/2	38	2	50	5.3	151.2
8P	3/4HT	20	1 3/4	44	1 3/8	35	2	56.7
S8	1/2F**	15	1 1/4	32	1 1/2	38	1.5	42.5
S8C	1/2F**	15	1 1/4	32	1 1/2	38	4	113.4
S8C	3/8F**	10	1 1/4	32	1 1/2	38	4	113.4
8FR	3/4HT	20	1 3/4	44	1 3/4	44	7.0	200



HT = Hose threaded connections, female inlet x male outlet connection  
 \*\* Female NPT threaded inlet x male NPT outlet connection

**IMPORTANT:** Inquire with governing authorities for local installation requirements.

22.22: continued

(7) Installation Approval and Permit Requirements.(a) Installation Approval.

1. No person shall install or remove or contract with another person for the installation or removal of any reduced pressure backflow preventer or double check valve assembly required by 310 CMR 22.22 unless a design data sheet with plans showing the method of protection of the public water distribution system has been approved by the Department, its Designee or the public water system for the installation of such device.
2. All persons shall obtain approval from the local plumbing inspector or the head of the local fire department, to the extent required by the State Plumbing Code, 248 CMR 10.04(3), or M.G.L. c. 148, § 27A, for the initial installation or retrofit for any change in the installation of any air gap separation with tank and pump arrangement, reduced pressure backflow preventer, or double check valve assembly.
3. Prior to the installation of any pressure or atmospheric vacuum breaker, backflow preventer with intermediate atmospheric vent, or barometric loop, the plans and specifications for the plumbing work must receive a permit issued pursuant to 248 CMR 10.04(3) by the local Plumbing Inspector. For these devices, a plumbing permit issued under 248 CMR 10.04(3) shall constitute installation approval pursuant to 310 CMR 22.22.
4. All design data sheets and plans for the installation of backflow prevention devices shall be reviewed by a certified cross connection surveyor as of December 31, 1998.
5. Design data sheets and plans for the installation of a backflow prevention device on fire protection systems shall not be approved by the public water system until a building permit has been issued by the Building Official who has jurisdiction over such system in accordance with 780 CMR 1.00: *Scope and Administration* and 9.00: *Fire Protection Systems* and approval by the head of the local fire department.

(b) Permit Requirement.

1. Any person owning or maintaining a cross connection protected by a double check valve assembly or a reduced pressure backflow prevention device that was approved by the Department, its designee or public water system shall register such protected cross connection device(s) with the public water system in accordance with 310 CMR 22.22(2). The Department will issue, upon request, one annual permit to the public water system covering only those registered cross connection devices identified by the public water system in its annual statistical report to the Department.
2. The Department reserves the right to revoke or suspend any conditional approval and/or permit for cause.

(c) The Department may revoke any approval or permit for any installation or change in installation of any backflow prevention device which is found to be in noncompliance with 310 CMR 22.22.

(8) Location of Devices.

(a) The location of each approved backflow prevention device, with respect to the plumbing on the premises and the service connection to the premises, shall be based upon the degree of existing or potentially existing health hazard, and shall conform to the following specific requirements:

1. Approved backflow prevention devices shall be located so that protection of all cross connections is achieved with a minimum number of devices;
2. Approved backflow prevention devices shall be located so as to provide in-plant protection;
3. The following types of facilities have been determined to present high health hazard conditions and in-plant protection shall be supplemented by installation of a reduced pressure backflow preventer or an air gap separation at the meter or property line unless an approved device is installed on a dedicated or process line, or if protection of the in-plant cross connection(s) is achieved to the satisfaction of the Department, its Designee or the public water system at:
  - a. Nuclear reactors or other facilities where radioactive materials are used;
  - b. Sewage treatment plants and sewage pumping stations;
  - c. Piers, docks, marinas, shipyards;
  - d. Chemical plants;
  - e. Metal plating industries;
  - f. Hospitals, mortuaries, medical clinics, dental offices and clinics;

22.22: continued

g. Laboratories, except when the Department or its Designee has made a specific determination that no health hazard exists on the premises;

h. Other types of facilities as determined in writing by the Department or its Designee.

(b) If, upon request by the owner of the premises or upon its own initiative, the Department or its Designee or the public water system determines that it is unreasonable to locate all cross connections within the premises, or the Department or its Designee determines that protection of all cross connections is unreasonable for economic reasons, then:

1. the public water supply distribution system shall be protected by installation of a reduced pressure backflow preventer or an air gap separation at the meter or property line; and

2. the owner of the premises shall provide a safe, alternative supply of potable water, well marked and labeled, to all domestic water fixtures on the premises.

(9) Types of Backflow Prevention Devices Required.

(a) Subject to the provisions of 310 CMR 22.22(10): *Table 22-1* shall serve as the guide for the type of protection required.

*Table 22-1*

AG - Air Gap  
 RPBP - Reduced Pressure Backflow Preventer  
 DCVA - Double Check Valve Assembly  
 AVB - Atmospheric Vacuum Breaker  
 PVB - Pressure Vacuum Breaker  
 BPIAV - Backflow Preventer with Intermediate Atmospheric Vent

Types of Hazard on Premises	Acceptable Types of Backflow Preventers						Comments*
	AG	RPBP	DCVA	AVB	PVB	BPIAV	
1. Sewage Treatment Plant	X	X					
2. Sewage Pumping Station	X	X					
3. Food Processing	X	X	X*				*If no health hazard exists
4. Laboratories	X	X	X*				*If no health hazard exists
5. Fixtures with hose threads on inlets	X	X	X	X			In addition to an air gap separation, all fixtures that have a threaded hose type connection shall at a minimum, be equipped with a AVB in accordance with 248 CMR 10.14
6. Hospitals, Mortuaries, Clinics	X	X					
7. Plating Facilities	X	X					
8. Irrigation Systems	X	X		X*	X**		Each case should be evaluated individually. *An AVB can be used if no back pressure is possible and no health hazard exists **Pressure Vacuum Breakers can be installed if back pressure is not possible
9. Systems or Equipment Using Radioactive Material	X	X					
10. Submerged Inlets	X	X		X*			*If no health hazard exists and no back pressure is possible
11. Dockside Facilities	X	X					
12. Valved outlets or fixtures with hose attachments	X	X		X*			Each case should be evaluated individually *If no health hazard exists and no back pressure is possible
13. Commercial Laundries and Dry Cleaners	X	X					
14. Commercial Dishwashing Machines	X	X		X*			*If no health hazard exists
15. High and Low Pressure Boilers	X	X*					*If chemicals are added
16. Low Pressure Heating Boilers						X	Residential and small commercial, having no chemicals added

310 CMR: DEPARTMENT OF ENVIRONMENTAL PROTECTION

22.21: continued

1. the provision or requirements from which the variance is being sought;
2. the identity of the proponent of the well, wellfield, or spring;
3. the identity of the person requesting the variance, the address where a copy of the request for variance will be available for public inspection, and the times it will be available; and
4. a statement that the Department will receive written comments concerning the request from the public for a 30 day period commencing on the last date of newspaper publication.

(f) Each person submitting a request for variance shall submit to the Department a copy of the public notice required by 310 CMR 22.21(5)(e) and affidavits attesting to the fact that the notices have been given. The Department will receive written comments concerning the request from the public for a 30 day period commencing on the last date of newspaper publication.

(g) Within 30 days of the close of the comment period, each person requesting a variance under 310 CMR 22.21(5)(a) shall respond in writing to all reasonable public comments received by the Department.

(h) The Department may schedule a public hearing on any request for variance submitted in accordance with 310 CMR 22.21(5) if it determines on the basis of the public comments received that such a hearing is in the public interest. In the event that the Department schedules a hearing, the person filing the request shall notify persons served by the supplier of water of the hearing by publication on not less than three consecutive days in a newspaper of general circulation in the service area of the supplier of water. In addition, the person filing the request shall notify each person who submitted written comment concerning the request to the Department by direct mail. The person filing the request shall submit to the Department a copy of the public notices required by 310 CMR 22.21(5)(h), and an affidavit attesting to the fact that the notices have been given, prior to the hearing. Persons filing a request for a variance under 310 CMR 22.21(5) shall pay the full the cost of all notifications and public hearing scheduled.

(i) Within 30 days of the grant of a variance under 310 CMR 22.21(5), any person that receives a variance shall notify persons served by the supplier of water of the granting of the variance, including any conditions imposed by the Department, by direct mail and by publication on not less than three consecutive days in a newspaper of general circulation in the service area of the supplier of water. The person that receives the variance shall submit to the Department a copy of the public notices and an affidavit attesting to the fact that the notices have been given upon completion of the public notification.

22.22: Cross Connections Distribution System Protection

(1) Purpose. The Department's purpose in establishing a comprehensive distribution protection program is to prevent the contamination of drinking water to the last free flowing outlets or consumer's tap. For this reason, the Department strongly advocates the elimination of all cross connections. The installation of backflow prevention devices does not eliminate a cross connection. The installation of backflow prevention devices is a protection solution when re-plumbing or re-piping is not feasible. All cross connection protection devices shall be approved and permitted in accordance with 310 CMR 22.22.

(2) Maintenance of a Cross Connection

(a) No physical cross connection shall be maintained between the distribution system of a public water system, the water of which is being used for drinking, domestic, or culinary purposes, and the distribution system of any water source not approved by the Department, as being of safe sanitary quality, or any plumbing, fixture, or device whereby nonpotable water or other substances might flow into the potable water system, unless said connection has been protected by a backflow prevention device approved, in accordance with 310 CMR 22.22 or 248 CMR 10.00: *Uniform State Plumbing Code*; as applicable.

(b) Backflow prevention devices shall be installed, based on the degree of hazard involved, at all fixtures and equipment where backflow and/or back siphonage may occur and whenever a minimum air gap cannot be provided between the public water system outlets to the fixture or equipment and its flood level rim. All fixtures that have a threaded hose type connection shall, at a minimum, have the required air gap separation and be equipped with a vacuum breaker in accordance with 248 CMR 10.14: *Water Supply and the Water Distribution System*;



## 22.22: continued

- (c) Where a water connection is not subject to back pressure, a non-pressure type vacuum breaker shall be installed on the discharge side of the last valve on the line serving the fixture or equipment.
- (d) Cross connections maintained or created on fire protection system shall comply with 310 CMR 22.22(9)(d).
- (e) All cross connection requiring the installation of a double check valve assembly or a reduced pressure backflow preventer shall be approved and registered by the public water system.
- (f) Cross connections protected by a device other than a double check valve assembly or a reduced pressure backflow preventer, approved and permitted by the inspector of plumbing in accordance with 248 CMR 10.00: *Uniform State Plumbing Code* do not require the approval of the Department, its designee or the public water system.
- (g) Except for the installation of backflow prevention devices on fire protection systems, no double check valve assembly or reduced pressure backflow preventors shall be installed on a cross connection until the application for a plumbing permit is accompanied by a letter of approval from the Department, its designee or public water system pursuant to 248 CMR 10.14: *Water Supply and the Water Distribution System*.
- (h) Subject to applicable laws and regulations, public water systems shall have the authority to terminate any water service connection to any facility where cross connections are found to be in non-compliance with 310 CMR 22.22. The supplier shall deny water service to any premises where cross connections exist until corrective action is taken. If necessary, water service shall be disconnected for failure to test or maintain backflow prevention devices in a manner acceptable to the supplier. If it is found that the backflow prevention device has been removed or by-passed or otherwise rendered ineffective, water service shall be discontinued unless corrections are made immediately.
- (i) The public water system shall establish a time for completion of necessary corrections or removal of actual or potential cross connections, taking into consideration the degree of hazard involved and the time required to obtain and to install the needed equipment. The public water system shall use every means at its disposal to obtain voluntary compliance. However, if proper protection has not been provided after a reasonable period of time (following legal notification and subject to applicable laws and regulations), the public water system shall physically separate the public water supply from the on-site piping system in such a manner that the two systems cannot again be connected by an unauthorized person.
- (j) Cross connections between a public water system and a private well or individual water source serving residential dwellings used for potable or nonpotable purposes are prohibited.
- (k) All backflow prevention devices shall be installed and repaired by a Massachusetts licensed plumber, except for backflow prevention devices installed on fire protection systems. A Massachusetts licensed fire sprinkler contractor is responsible for all work conducted on a fire protection system, including the installation, maintenance and repair of backflow prevention devices.
- (l) An anti-siphon or back pressure device shall be installed on any apparatus that pumps any chemical into a potable water supply to prevent back siphonage.
- (3) **Public Water System Responsibilities.** Every public water system shall be responsible for:
- (a) Controlling cross connections to the last free flowing outlet of the consumer and for the safety of the public water system under its jurisdiction.
  - (b) Having a cross connection control distribution system protection program plan (the "cross connection program plan") approved by the Department as specified at 310 CMR 22.22(3)(b).
    1. Every public water system is required to have its cross connection program plan approved by the Department by June 1, 1994.
    2. Each plan must be prepared in accordance with departmental guidance and shall include, at a minimum, the following information: description of current program (*i.e.* staffing, tracking, surveying, testing, training and fee requirements) and evaluation of the current program, proposed changes and implementation plans. The plan shall also include an explanation of how the public water system will satisfy 310 CMR 22.22(3)(c) through (r).

22.22: continued

3. The plan shall be fully implemented and operational by January 1, 1999. A public water system may use a contractor, subcontractor, or consultant to assist in the program implementation except as specified at 310 CMR 22.22(3)(r). However, every public water system shall continue to be responsible for compliance with 310 CMR 22.22 and subject to enforcement by the Department.
  4. The public water system shall obtain the Department's written approval prior to modifying its approved cross connection plan.
- (c) Inspecting and surveying of all industrial, commercial, and institutional premises served by the public water system to determine if cross connections exist and that all cross connections are properly protected by an appropriate device or eliminated.
  - (d) Maintaining on the public water system premises in a readily accessible form the following documentation:
    1. a schedule of all facilities inspected and surveyed;
    2. records of all device locations;
    3. related correspondence, including notices of violation; and
    4. list of devices and inspections of approved backflow prevention devices.
  - (e) Ensuring that all backflow prevention device inspections are conducted by a Massachusetts Certified Backflow Prevention Device Tester and surveys for cross connections are conducted by a person who is certified by the Department as a Massachusetts Certified Cross Connection Surveyor.
  - (f) Establishing and maintaining a cross connection control program for residential users which shall include an educational component.
  - (g) *Not allowing any cross connection at any point within its system unless said cross connection is approved pursuant to 310 CMR 22.22 or 248 CMR 10.00: Uniform State Plumbing Code.*
  - (h) Ensuring that all double check valve assemblies and reduced pressure backflow preventer devices are inspected and tested in accordance with the public water system program plan as approved by the Department and as specified at 310 CMR 22.22(13). The public water system has the option of testing the devices itself, having the device tested by the device owner, or having the testing conducted by a contractor.
  - (i) Establishing a program for auditing for devices not tested by public water system staff.
  - (j) Submitting a report to the Department annually on a form or in a format specified by the Department that shall include the following minimum information:
    1. a list of or information on all cross connections protected by an approved double check valve assembly or approved reduced pressure backflow preventer devices;
    2. the numbers and types of facilities surveyed yearly; and
    3. the number type and location of violations found.
  - (k) Assisting Department personnel in any cross connection related inspections and backflow device installations;
  - (l) Taking appropriate action to eliminate cross connections and hazardous conditions, strongly promote compliance, and take the appropriate enforcement action when necessary;
  - (m) Notifying the cross connection owner of any violations of 310 CMR 22.22 by sending a Notice of Violation to owner;
  - (n) Notifying all device owners of their responsibilities relative to cross connections control and 310 CMR 22.00.
  - (o) Annually notify consumers of water and local public officials of the requirements of the distribution system cross connection control program, including Mayors, Town Managers, city and town councilors or selectmen, water commissioners, fire chiefs, local boards of health, plumbing inspectors, building inspectors, local state representatives, unless waived in writing by the Department.
  - (p) Generating all necessary correspondence relative to the administration and operations of the cross connection control program. The public water system will be responsible for all correspondence to device owners. All correspondence relating to the cross connection control program must be signed by the public water system.

22.22: continued

(q) Reviewing and approving design data sheets and plans for proposed new installations of reduced pressure backflow preventers, and double check valve assemblies. All design data sheets and plans shall be reviewed by a Massachusetts Certified Cross Connection Surveyor, effective January 1, 1999 as specified at 310 CMR 22.22(7)(a)4. The public water system may not delegate, or subdelegate, contract, or subcontract this responsibility to any other entity, unless otherwise authorized in writing by the Department. The Department will require that all recommendations or findings made by the contracted certified surveyor, when reviewing and approving data sheets and plans, be submitted on the public water system letterhead and signed by an authorized person of the public water system.

(r) Ensuring, upon completion of installation that backflow prevention devices are installed according to the approved design data sheet and plans and tested for proper operation, effective January 1, 1999.

(4) Owners' Responsibilities. The owner of any cross connection protected by a double check valve assembly or reduced pressure backflow preventer shall:

(a) Notify the public water system of all cross connections protected by a double check valve assembly or reduced pressure backflow preventer and comply with all necessary approvals and permits from the public water system and/or the Department for the maintenance of cross connections, as specified at 310 CMR 22.22;

(b) Have suitable arrangements made so that inspections of backflow prevention devices and cross connection surveys can be made during regular business hours;

(c) Maintain a spare parts kit and any special tools required for the removal and reassembly of backflow prevention devices;

(d) Provide the necessary labor for inspection and testing by the Certified Backflow Prevention Device Testers or Certified Cross Connection Surveyor;

(e) Overhaul, repair, or replace within 14 days of the initial inspection date and retest pursuant to 310 CMR 22.22(13)(e), any device which fails a test or is found defective;

(f) Submit copies of the Inspection and Maintenance Report Form as required by the public water system.

(g) Maintain on the premises complete records on all devices for the life of said devices including as-built plans and design data sheets; maintain for seven years the Inspection and Maintenance Report Forms for tests conducted by the certified.

(h) Make certain that the cross connection protection device is tested as specified at 310 CMR 22.22(13) or as required by the public water system.

(5) Certified Backflow Prevention Device Tester's Responsibilities. Certified Backflow Prevention Device Testers have the following responsibilities relative to cross connections:

(a) Having a backflow preventer test kit that is maintained in proper working order and calibrated annually;

(b) Recording the test results for each inspection conducted;

(c) Submitting copies of inspection reports to the water supplier, and the owner within 30 days of the inspection; and

(d) Maintaining records of all test results for a minimum of seven years.

(6) Local Plumbing Inspector Responsibilities. Local Plumbing Inspectors, authorized by M.G.L. c. 142 to administer and to enforce 248 CMR 10.00: *Uniform State Plumbing Code*, have the following responsibilities relative to cross connections:

(a) As required by 248 CMR 10.14(6), the Inspector of Plumbing will ensure that potable water supply systems are designed, installed and maintained in a manner as to prevent contamination from non-potable liquids, solids or gases which may be introduced to a potable water supply system through cross connections;

(b) After reviewing the plans and specifications for plumbing work under 248 CMR 10.04(5), and before issuing a permit, the Plumbing Inspector, as required by 248 CMR 10.14, shall require the installation of appropriate devices in accordance with 310 CMR 22.00; and

(c) No plumbing permit shall be issued for cross connection installations requiring Reduced Pressure Zone Backflow Preventors or Double Check Valve Assemblies until the application for such permit is accompanied by a letter of approval from the Department, its Designee or public water system.