THE CORPORATION OF THE CITY OF PEMBROKE

BY-LAW NUMBER 2007-24

A BY-LAW TO REGULATE THE SUPPLY OF SAFE AND WHOLESOME WATER TO THE CITIZENS IN THE CITY OF PEMBROKE (CROSS CONNECTION/BACKFLOW PREVENTION BY-LAW)

WHEREAS Section 130 of the Municipal Act, S.O. 2001, c.25, as amended from time to time, authorizes a municipality to regulate matters for purposes related to the health, safety and well-being of the inhabitants of the municipality;

AND WHEREAS Section 11(1) 4 of the Municipal Act, S.O. 2001, c.25, as amended from time to time, authorizes a municipality to pass by-laws respecting matters relating to public utilities;

AND WHEREAS Section 80(1) of the Municipal Act, S.O. 2001, c.25, as amended from time to time, authorizes a municipality, at reasonable times, to enter on land to which it supplies a public utility to inspect, repair, alter or disconnect the service pipe or wire, machinery, equipment and other works used to supply the public utility;

AND WHEREAS Section 80(2) of the Municipal Act, S.O. 2001, c.25, as amended from time to time, authorizes the municipality to shut off or reduce the supply of the public utility to the land;

AND WHEREAS Section 80(3) of the Municipal Act, S.O. 2001, c.25, as amended from time to time, authorizes the municipality to enter on the land to shut off the supply of the public utility, to remove any property of the municipality or to determine whether the public utility has been or is being unlawfully used.

NOW THEREFORE THE MUNICIPAL COUNCIL OF THE CITY OF PEMBROKE "THE CITY" ENACTS AS FOLLOWS:

1. SHORT TITLE

This By-law shall be known as the "**Cross Connection/Backflow Prevention By-law**" of The Corporation of the City of Pembroke.

2. DEFINITIONS

"ASSE" means the American Society of Sanitary Engineering;

"AWWA" means the American Water Works Association;

"Authorized Functions List" means the list of functions and the persons authorized to carry out such functions as set out in Appendix "A" of this By-law;

"Authorized Person" means a person who is authorized to carry out a function as set out in the Authorized Functions List, Appendix "A" of this By-law;

"Auxiliary Water Supply" means any water source or system other than the City's direct water supply that may be available in a building or on any property, including any recycled water, cistern and/or well;

"Backflow" means the flowing back of, or reversal of the normal direction of flow of water;

"Backflow Prevention Device" means a device that prevents backflow and includes a reduced pressure principle assembly, dual check valve or double check valve, etc;

"Back Pressure" means the pressure on the downstream side of the piping system is greater than the pressure on the upstream side;

"Back Siphonage" means backflow caused by pressure below atmospheric pressure in the supply system;

"Building" shall have the same meaning as set out in the Building Code Act, S.O. 1997, c. 23, as amended;

"Chief Building Official" means a chief building official or his or her designate appointed or constituted under Sections 3 or 4 of the Ontario Building Code Act, as amended, for The Corporation of the City of Pembroke;

"City" means The Corporation of the City of Pembroke, its agents and/or designates;

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"Contamination" means an impairment of a potable water supply by the introduction or administration of any foreign substance that degrades the quality and creates a health hazard. This includes microbiological hazards (waterbourne diseases), chemical hazards (general and long-term health effects) and physical hazards (burns due to gases, steam, etc.);

"Cross Connection" means any actual or potential connection between a potable water supply or system and any actual or potential source of pollution or contamination, including but not limited to any by-pass, jumper connection, removable section of pipe, swivel or changeover device, wells, auxiliary water supply and any other temporary or permanent connecting arrangement through which backflow may occur as determined by the City;

"Cross Connection/Backflow Prevention Survey Form" means the form set out in Appendix "B" of this By-law;

"CSA Standards" means the document entitled National Standard of Canada - CAN/CSA B64.10- 94 as amended - Manual for the Selection, Installation, Maintenance and Field Testing of Backflow Prevention Devices -Plumbing Products or Materials - A National Standard of Canada published in 1994 by the Canadian Standards Association or any successor thereof.

"Fee" means a fee as outlined in the Schedule of Fees and Service Charges, as provided by the Treasury Department of the City of Pembroke.

"Good repair" means:

- free from health hazard,
- free from fire hazard,
- in good working order,
- not in poor condition by reason of deterioration, neglect, damage or defacement,
- able to perform its intended function, and;
- protected from freezing

"High or Severe Hazard Location" means any location where any cross connection or potential cross connection which involves or could potentially involve any substance that could be a danger to health. Examples shall include but are not limited to hospitals, all establishments involving chemical usage, high hazard uses as defined by The Canadian Standards Association or any other use as determined from time to time by the Manager of Operations and/or the Chief Building Official;

"Installation Guide" means the installation drawing(s) governing the installation of backflow prevention devices as set out in Appendix "D" of this By-Law;

"Manager of Operations" means the Manager of Operations of The Corporation of the City of Pembroke, and includes his or her designate;

"Owner" means any person, firm or corporation having control over property to which the By-law applies and includes the owner registered on the title of the property and any occupant of any building or structure located on such property;

"Potable Water" means water that is safe for human consumption;

"Premise Isolation" means isolation of the water located within the building or structure from the City's water supply;

"Selection Guide" means the Backflow Prevention Device Selection Guide set out as Appendix "C" of this By-Law;

"Source Isolation" means isolation of the water located within or having flowed through a source or potential source of contamination within a building or structure, including a device, machine, water system, etc. from any potable water system;

"Structure" means anything constructed or built permanently or temporarily which is provided with a source of potable water;

"Survey" means a complete review of the potable water system or systems located within a building or structure to determine the presence of any existing backflow prevention systems and/or any cross connections;

"Testable" means the ability to conduct tests to determine if a device is functioning properly;

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"Tester" means a person who is a certified backflow prevention device tester who has successfully completed a cross connection course in backflow prevention device testing as per the CAN/CSA B64.10-94, as amended, and approved by the Manager of Operations or his designate;

"Test Report" means a report in the form set out as Appendix "E" of this By-Law;

"Water Meter" means the water meter installed within a premise to record the amount of water supplied to such premises by the City of Pembroke;

"Water Purveyor" means any City owned and operated water supply and distribution system;

"Zone Isolation" means the isolation of the water located within an area of a building or structure from any potable water system located within such building or structure.

3. APPLICATION

3.0 This By-law applies to all existing and future industrial, commercial, institutional and multi-residential buildings and structures, except buildings of residential occupancies within the scope of Section 9 of the Ontario Building Code, as amended, unless the Manager of Operations or his designate requires a backflow preventer to ensure no cross connection.

3.1 In addition to and notwithstanding Section 3.0, the Manager of Operations or his designate has the authority to determine whether a condition exists in any building or structure that may be hazardous or detrimental to the City's potable water supply, whereby any provisions of this By-law shall apply, at the City's sole discretion.

4. CROSS-CONNECTION PROHIBITED

4.0 No person or owner shall connect, cause to be connected, or allow to remain connected to the City's water supply, any other potable water system, an auxiliary water supply, piping, fixture, fitting, container, appliance, vehicle, machine, etc. in a manner which may under any circumstance, allow water, waste water or any other liquid, chemical or substance to enter such supply or system.

4.1 In addition to Section 4.0 and in accordance with all other provisions of this By-law, every owner of property to which this By-law applies shall ensure that a backflow prevention device is installed. Exemptions to these provisions are to be approved, by permit, by the Manager of Operations or his designate, prior to the work being done.

4.2 No person or owner shall connect, cause to be connected, or allow to remain connected to the City's water supply any auxiliary water supply.

5. PERSONS PERMITTED TO CARRY OUT WORK

5.0 Only the persons listed in the Authorized Functions List (Schedule 'A') shall carry out the corresponding functions set out in such list.

6. APPLICATION OF CSA STANDARDS

6.0 Except as otherwise set out in this By-law, the installation, maintenance and field-testing of backflow prevention devices shall be in accordance with the CSA Standards, and any amendments thereto.

6.1 Wherever the CSA Standards and this By-law are in conflict, the provisions of this By-law shall prevail as authorized by the Manager of Operations.

7. SELECTION OF BACKFLOW PREVENTION DEVICE

7.0 Every owner of a building or structure of a type set out in Section 3, subject to Section 3.1 of this By-law, shall, on demand or otherwise by the City, carry out a survey of each of his or her buildings and structures with respect to all existing cross-connections and all existing and required backflow prevention devices; and,

a) shall ensure that such survey is carried out on a Cross-Connection/Backflow Prevention Survey Form by a person permitted to do so pursuant to the Authorized Functions List; and

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b) shall ensure that the completed Cross-Connection/Backflow Prevention Survey Form is provided to the City within 14 days of the survey being conducted.

c) shall be completed no later than the last day of December in the year in which the survey was let, unless otherwise stated by the Manager of Operations or his designate.

d) where the owner of a building or structure fails to carry out the said survey, the Manager of Operations or his designate will complete the said survey, with the owner responsible for all associated costs.

e) no costs associated with the survey shall be borne by the City.

7.1 Once the survey is completed and reviewed by the Manager of Operations or his designate, the owner of a building or structure of the type set out in Section 3, subject to Section 3.1, who has completed the survey, shall install such devices as are necessary, as determined by the said survey, at no cost to the City.

7.2 Backflow prevention devices for premise, source or zone isolation shall be determined by:

a) using the Selection Guide; or

b) a professional engineer using the CSA Standards, where the type of cross-connection is not identified in the Selection Guide.

7.3 Every owner shall ensure that every backflow prevention device required for premise isolation on his or her property is a testable device, where possible.

7.4 Despite Section 7.3 of this By-law, the City may require that a particular backflow prevention device be used in respect of any cross-connection.

8. INSTALLATION OF BACKFLOW PREVENTION DEVICES

8.0 Every person installing a backflow prevention device shall ensure that:

a) such device is installed in accordance with acceptable engineering practices and the requirements of the Ontario Building Code, (Ontario Regulation 350/2006) as amended, this By-law, the Installation Guide and the CSA Standards;

b) such device is installed in a building or structure;

c) such device is located in such a manner so that in the event of backflow the device prevents contamination of the City's water supply;

d) where such device is installed in respect of premise isolation, such device is located downstream of the water meter, except where circumstances require the device to be installed upstream of the water meter and such location is to the satisfaction of the City;

e) where such device is installed in respect of premise isolation, all piping between the service pipe entering the building to the backflow preventer is clearly labeled "no connection permitted";

f) where such device is installed in respect of source or zone isolation, all piping between the point of contamination and the point at which the device is located is labeled "non-potable water"; and

g) where such device is installed in a public pool as defined in the Ontario Building Code (Ontario Regulation 350/2006) as amended, all exposed water piping and chlorine piping within the water treatment service room shall be colour coded by means of:

i) painting the entire outer surface of the piping, or
ii) coloured bands at least 25mm in width that are spaced along the piping at intervals of not more than 1200mm;
iii) colour coding referred to in (i) and (ii) shall be yellow for chlorine and green for potable water.

8.1 Every owner of property upon which a backflow prevention device is installed shall ensure that such device is in proper working order at all times.

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8.2 The cost associated with the installation of a backflow prevention device is the responsibility of the owner and the installation will be at no cost to the City.

9. TESTING OF DEVICES

9.0 a) Should a test show that a cross connection control device is not in good working condition, the Manager of Operations or his designate shall give notice to the customer to make repairs or replace the device within 96 hours, or a specified lesser period, and if the customer fails to comply with such notice, the Manager of Operations or his designate shall direct the shut off of the service or services.

b) The water service pipe shall not be turned on at the curb stop for occupancy use until the private plumbing system has been approved by the City designate or has been inspected for cross connections by the Manager of Operations or his designate; this shall not prohibit the use of a water service for construction purposes for a limited time, provided the Manager of Operations or his designate is satisfied that adequate provision is made to prevent backflow into the City distribution system.

c) No private water piping shall be installed or operated within the City to carry potable water, non-potable water or wastewater without the approval of the Manager of Operations or his designate. Unless otherwise specifically approved by the Manager of Operations or his designate, private water piping installed parallel to the City distribution system shall have at least three meters horizontal separation. All private pipes and their valve boxes, hydrants or other appurtenances shall be identified in a manner approved by the City.

d) No person shall install a potable water piping system on private or City property using solder or other plumbing material which are not in accordance with the AWWA as amended, the requirements of the Ontario Building Code as amended, and the City's approval.

9.1 Every person who tests a backflow prevention device shall carry out such testing in accordance with this By-law and the CSA Standards, as amended.

9.2 In addition to the testing methods set out in Section 6 of the CSA Standards, test procedures established by the ASSE as amended or AWWA as amended, for testing backflow prevention devices may be employed, at the City's discretion.

9.3 Despite Section 6.3.1 of the CSA Standards and its amendments, every person who tests a backflow prevention device shall enter the results of such test on a Test Report (Appendix "E").

9.4 Every person who tests a backflow prevention device shall:

a) within 14 days of carrying out such test, provide a legible and complete Test Report to the Manager of Operations or his designate;

b) upon completing such test, complete and affix a Test Tag to the device or immediately adjacent to the device on the piping connected thereto;

c) upon finding that such device is malfunctioning or otherwise not in proper working order, immediately notify the City and the owner of the premises of such condition, followed by written notification within 24 hours.

9.5 Every owner who has a backflow prevention device located on his or her property shall ensure that:

a) such device is tested by an approved tester when it is first installed and annually thereafter, and when it is cleaned, repaired, overhauled or relocated, or when otherwise requested at the discretion of the Manager of Operations; and,

b) when such device is tested that a Test Report copy is provided to the Manager of Operations within 14 days of the test being conducted; and,

c) in the event that such device is malfunctioning or otherwise not in proper working order, the Manager of Operations shall be notified immediately, followed by written notification within 24 hours.

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10. CONTRAVENTION AND ORDERS TO CORRECT

10.0 Where the City believes that a condition exists on any property that may allow contamination of the City's water supply or the contamination of any other potable water system on such property, including any residential building or structure, the Manager of Operations or his designate may;

a) order the owner to eliminate the condition and in so doing, may prescribe the time period for compliance with such Order.

b) at any reasonable time, enter onto the property of any owner to inspect for compliance with this By-law.

c) immediately may shut off the water supply to the property or any portion thereof until the condition is eliminated, if the condition is, or potentially is, hazardous to the supply of water.

d) shut off the water supply to the affected property or any portion thereof, where any person contravenes any provision of this By-law, until the contravention is rectified.

11. REMOVAL OF BACKFLOW PREVENTION DEVICES PROHIBITED

11.0 No person shall remove a backflow prevention device or part thereof after it has been installed and no owner of a building or structure in which a backflow prevention device is installed shall cause or permit the removal of such device, unless such removal is:

a) to facilitate the repair of the device and such device is replaced immediately after such repair is carried out;

b) to replace the device with another device that meets or exceeds the provisions of this By-law.

12. GENERAL PROVISIONS

12.0 A plumbing permit is required to install, repair or replace a backflow prevention device. The provisions of the Ontario Building Code, as amended, continue to apply to each installation in addition to the provisions of this By-law.

12.1 Every owner of property upon which a backflow prevention device is installed, shall ensure that such device is in good repair at all times.

12.2 In addition to any other provision of this By-law, the City may at any time order an owner to conduct tests, provide reports and undertake any other measures required for the prevention of backflow or protection of a cross-connection.

12.3 Where a timeframe is set out in this By-law for carrying out any action, the City may extend the time for compliance beyond the established timeframe provided such extension is acceptable to the City.

12.4 All sections of this By-law shall be deemed to be separate and independent and the invalidity of any section or provision hereof shall not affect the remaining sections.

13. OFFENCES

13.1 Every person who contravenes any provision of this By-law is guilty of an offence and on conviction is liable to a fine as provided for in the Provincial Offences Act, R.S.O. 1990, c. P.33. and its amendments.

14. BACKFLOW PREVENTION DEVICE PERMIT FEES

14.1 All fees for plumbing permits shall be in conformance with the City Building By-law and its amendments.

15. COMPLIANCE

15.0 Installation of Backflow Prevention Devices shall occur prior to the date set out below for the degree of hazard:

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Degree of Hazard According To Selection Guide Schedule "C"	Compliance Date
Severe	within 30 days of a non-compliance
Moderate and Minor	within 1 year of the passing of this By-Law

READ A FIRST AND SECOND TIME this 3rd day of April, 2007.

Terry Lapierre
Chief Administrative Officer

Mayor

READ A THIRD TIME AND PASSED this 3rd day of April, 2007.

Terry Lapierre
Chief Administrative Officer

Mayor

APPENDIX "A"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

AUTHORIZED FUNCTIONS LIST

ITEM	FUNCTION	Professional Engineer with Tester's License	*Certified Master Plumber with Contractor and Tester's License	Master Plumber with Contractor and Tester's License	Journeyman Plumber with Tester's License	**Apprentice Plumber with Tester's License	Fire System Sprinkler Fitter with Tester's License	Lawn Irrigation System Installer with Tester's License	City Authorized Personnel With Tester's License
1	Carry out cross connection survey	☒	☒	☒	☒				☒
2	Install, relocate or replace backflow prevention device			☒	☒	☒			☒
3	Repair of backflow prevention device	☒	☒	☒	☒	☒			☒
4	Test backflow prevention device	☒	☒	☒	☒	☒			☒
5	Items 1,2,3, & 4 in respect of fire protection system						☒		
6	Items 3 & 4 in respect of lawn sprinkler systems							☒	

* Required to be under the direction of a Professional Engineer.
** Under the direct supervision of a Journeyman Plumber or Master Plumber.

APPENDIX "B"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

CROSS CONNECTION/BACKFLOW PREVENTION SURVEY

Plumbing System ☐
Fire Protection System ☐

Date: _____

Facility Name: _____ Owner: _____
Facility Address:
_____

Surveyor Name: _____ License # : _____ Phone # : _____
(please print)

	Location of Cross Connection	Existing Protection Type	Serial # (if applicable)	Date of last test (if applicable)	Acceptable Protection Yes/No	Required Upgrade	Selection From**	Remarks
	PREMISE							
	PREMISE							
1								
2								
3								
4								
5								

**Section from: S – City of Pembroke Selection Guide
P – Professional Engineer *attach selection documentation
M – Manufacturer Supplied Device

A Building Permit is required for installation of these devices:

AG	Air Gap
AVB	Atmospheric Type Vacuum Breaker
DCAP	Dual Check Valve Type with Atmospheric Port
DCVA	Double Check Valve Assembly Type
DUC	Double Check Valve Type
DUCV	Dual Check Valve Type with Intermediate Vent
HCVB	Hose Connection Type Vacuum Breaker
LACV	Listed Alarm Check Valve
LFVB	Laboratory Faucet Type Vacuum Breaker
N	None
PVB	Pressure Type Vacuum Breaker
RSCV	Resilient Seated Check Valve
RP	Reduced Pressure Principle Type

# of pages _____

All selections shall be made in accordance with Schedule "A" of this By-law. The City has jurisdiction over all selections.
The Surveyor is required to submit copies of this report to the property owner and to the City of Pembroke within 14 days, per the above-noted By-law.
This document must be printed, complete and legible. Please use a second sheet if required.

APPENDIX "C"
TO THE CITY OF PEMBROKE
BY-LAW 2007–24

BACKFLOW PREVENTION DEVICE SELECTION GUIDE

INTERPRETATION

In addition to those terms defined in Section 2 of By-law 2007-24 and its amendments thereto, the following terms shall have the corresponding meanings for the purposes of this Appendix:

"air gap (AG)" means the unobstructed vertical distance through air between the lowest point of the water supply outlet and the flood level rim of the fixture or device into which the outlet discharges;

"back siphonage" means backflow caused by pressure below atmospheric in the supply system;

"double check valve assembly (DCVA)" means a backflow prevention device consisting of two force-loaded, independently acting check valves, including tightly closing resilient-seated shutoff valves located at each end of the assembly and fitted with properly located resilient-seated test cocks. The device is designed for use under continuous pressure;

"dual check valve (DUC)" means a backflow prevention device consisting of two independently acting, force-loaded, soft-seated check valves in series. This device does not have a relief port or test cocks. This device is designed for use under continuous pressures;

"dual check valve with atmospheric port (DCAP)" means a backflow prevention device that consists of two independently acting check valves separated by an intermediate chamber with an atmospheric port. A chamber pressure higher than the supply pressure is required to open the port when there is a positive pressure on the supply side. This device is designed for use under continuous pressure;

"dual check valve with intermediate vent (DUCV)" means a backflow prevention device that consists of two independently acting check valves biased to a normally closed position. Between the check valves there is a relief port that is biased to a normally open position. This device is designed for use under continuous pressure;

"reduced pressure principle assembly (RP)" means a backflow prevention device that consists of a mechanically independently acting, hydraulically dependent relief valve located in a chamber between two independently operating, force-loaded check valves, the intermediate chamber pressure always being lower than the supply pressure when there is a positive pressure on the supply side. The unit includes properly located resilient-seated test cocks and tightly closing resilient-seated shut off valves at each end of the assembly. This device is designed for use under continuous pressures;

"minor hazard" means any cross-connection or potential cross-connection that constitutes only a nuisance, with no possibility of any health hazard;

"moderate hazard" means any minor hazard that has a low probability of becoming a severe hazard;

"severe hazard" means any cross-connection or potential cross-connection involving any substance that could be a danger to health;

"vacuum breaker" means a device that will prevent backflow when pressure in the system upstream of the device falls below atmospheric pressure. Air is only admitted downstream of the device;

"vacuum breaker, atmospheric type (AVB)" means a vacuum breaker designed to be under pressure only when water is being drawn from the system and for short, intermittent periods of time;

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BACKFLOW PREVENTION DEVICE SELECTION GUIDE

'vacuum breaker, hose connection type (HCVB)" means a vacuum breaker consisting of a single force-loaded check valve biased to a normally closed position. Downstream of the check valve is a means of automatically venting to atmosphere that is force-loaded or biased to a normally open position. When the laboratory faucet is off, the check valves are closed and the port is open; when the faucet is on, the check valves are open and the port is closed;

"vacuum breaker, laboratory faucet type (LFVB)" means a vacuum breaker consisting of two independently acting check valves force-loaded or biased to a normally closed position. Between the check valves there is a relief port that is force-loaded or biased to a normally open position. When the laboratory faucet is off, the check valves are closed and the port is open; when the faucet is on, the check valves are open an the port is closed;

"vacuum breaker, pressure type (PVB)" means an assembly containing an independently acting check valve force-loaded or biased, to a normally closed position, and an independently operating air inlet valve force-loaded or biased to a normally open position and located on the discharge side of the check valve. The assembly is equipped with properly located resilient-seated test cocks and tightly closing resilient-seated shut off valves located at each end of the assembly. The device is designed for use under continuous pressure;

APPENDIX "C"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

BACKFLOW PREVENTION DEVICE SELECTION GUIDE

Type of Cross Connection	Degree of Hazard	MINIMUM Source Isolation Device	MINIMUM Premises Isolation Device*
Abattoir (slaughter house)	Severe		RP
Air compressor oil cooler	Moderate	DCVA	
Agricultural chemicals (sprayers)	Severe	AG, RP	
Animal watering	Moderate	AVB, PVB, DCVA	
Apartment building (within the scope of Part 3 of the Ontario Building Code)	Moderate		DCVA
Aspirator (toxic)	Severe	RP, AVB	
Aspirator (non-toxic)	Moderate	AVB, LFVB	
Autoclave	Severe	ABV, PVB Note: Zone RP protection required	
Automotive plant	Severe		RP
Automotive repair shop	Severe		RP
Autopsy and mortuary equipment	Severe	AVB, PVB Note: Zone RP protection required	
Baptistery	Moderate	AVB, PVB, DCVA	
Basin	Moderate	AG	
Bathtub (all)	Moderate	AG	
Bedpan washer	Severe	AVB, PVB Note: Zone RP protection required	
Bidet	Severe	AVB	
Bottle washer	Moderate	AG, AVB	
Bottle washer below flood level rim	Severe	RP, PVB	
Beverage processing plant	Severe		RP
Canopy washer	Severe	AVB, RP	
Car wash	Severe		RP
Carbonator	Minor	DCAP (stainless steel or plastic)	
Chemical feed tank	Severe	AG, RP	
Chemical plant	Severe		RP
Chiller tank	Severe	AG, RP	
Chlorinator	Severe	RP	
Clothes washer	Severe	AG, AVB	
Coffee machine	Minor	AG, DCAP	
College	Moderate		DCVA
Commercial coin-operated laundry	Moderate	AG, AVB	
Commercial laundry	Severe	RP	
Condensate tank (top feed)	Moderate	AG, AVB, DCVA	
Condensate tank (bottom feed)	Severe	RP	
Cooking kettle	Minor	AG, AVB	
Cooling condenser (solenoid upstream)	Minor	DCAP	
Cooling condenser (solenoid downstream)	Severe	RP	
Cooling tower	Severe	RP, AG	
Deaerator (top feed)	Moderate	DCVA	
Deaerator (bottom feed)	Severe	RP	
Degreasing equipment system	Severe	RP	
Deionized water	Severe	RP	
Dental vacuum pump	Severe	RP, AVB, PVB	

** Premise isolation is required on all sources. Its type will be dependent on the degree of hazard or source isolation that may be present.*

Type of Cross Connection	Degree of Hazard	MINIMUM Source Isolation Device	MINIMUM Premises Isolation Device*
Deionized water	Severe	RP	
Dental vacuum pump	Severe	RP, AVB, PVB	
Dental office	Minor		DCVA
Dental high speed hand piece, and air and water syringe	Minor		
Dental cuspidor (with internal air gap)	Minor	AG	
Dental cuspidor (no air gap)	Severe	RP, AG	
Detergent dispenser	Severe	AVB, RP	
Dish rinse unit with flex hose	Moderate	AG, AVB, DCAP	
Dishwasher (commercial)	Moderate	AG, AVB	
Distiller	Minor	AG	
Dockside marine facility	Severe		RP
Dye plant	Severe		RP
Emergency eyewash/shower – this equipment must be installed upstream of the zone isolation.			
Fire Protection Systems – General Conditions - Antifreeze solutions must be water solutions of pure glycerin (C.P. or U.S.P., 96.5% grade) OR propylene glycol conforming to NFPA. These are best described as food-grade chemicals. - Antifreeze solutions must be *tested* to verify compliance with above conditions. Any other antifreeze solution is NOT permitted and must be replaced. - Expansion chambers shall be of an appropriate size to compensate for thermal expansion of antifreeze solution. - An adequate amount of piping before or after the location of any backflow prevention device shall be increased in size to compensate for the pressure loss created by the device being installed. The flows are to be in accordance with NFPA, as amended, for the appropriate hazard classification in the area downstream of the backflow prevention device.			
Type of Cross Connection	**Degree of Hazard**	**MINIMUM Source Isolation Device**	**MINIMUM Premises Isolation Device***
Wet sprinkler system			listed alarm check valve, DCVA
Wet stand pipe system			resilient-sealed check valve, DCVA
Wet sprinkler or stand pipe system containing anti-freeze with listed alarm check valve			DCVA + Expansion tank/chamber
Wet sprinkler or stand pipe system containing anti-freeze *without* listed alarm check valve			RP + Expansion tank/chamber
Dry sprinkler or standpipe system			
Fire hydrant (private)			
Fire Service main connection to more than one of the following different sources of supply: i) City water supply system ii) a private water supply system, or iii) a source of non-potable water			RP
Flexible shower head	Minor	AVB	
Floor drain with flushing rim	Severe	AG, RP	
Flush tank	Moderate	AG,AVB	
Flushing equipment device	Severe	AG, AVB, PVB	
Flushometer	Severe	AVB	
Food processing plant	Severe		RP
Fountain, ornamental	Moderate	AG, AVB, PVB, DCVA	
Fountain, ornamental (chemical added)	Severe	AG, AVB, PVB, RP	
Funeral Home	Severe		RP
Garbage disposal unit	Severe	AVB, PVB, RP	
Garbage can washer	Severe	AG, AVB, PVB, RP	
Heating system (copper/plastic; no chemicals)	Minor	DCAP	
Heating system (no chemicals added)	Moderate	DCVA	
Heating system (chemicals added)	Severe	RP	
Hose bib	Moderate	HCVB	

** Premise isolation is required on all sources. Its type will be dependent on the degree of hazard or source isolation that may be present.*

Type of Cross Connection	Degree of Hazard	MINIMUM Source Isolation Device	MINIMUM Premises Isolation Device*
Hospital (non-treatment area)	Moderate		DCVA
Hospital (active treatment area)	Severe		RP
Hot tub	Moderate	AG, AVB	
Humidifier	Moderate	AG, DCAP	
Humidifier with sump	Severe	AG, RP	
Hydrotherapy bath	Moderate	AG, AVB	
Industrial fluid system	Severe	RP	
Irrigation system (chemical injected)	Severe	RP	
Irrigation system (pop up head & underground soaker)	Severe	RP, PVB, AVB	
Irrigation system (no chemical added)	Moderate	AVB, PVB, DCVA	
Lab bench equipment (toxic)	Severe	AVB, LFVB Note: Zone RP protection required	
Lab bench equipment (non toxic)	Minor	AVB, LFVB	
Laboratory	Severe		RP
Laboratory faucet	Severe	LFVB, AVB Note: Zone RP protection required	
Laundry machine	Moderate	AG, AVB	
Laundry tub faucet with hose bib connection	Moderate	HCVB, AVB	
Lavatory	Moderate	AG	
Lethal substance	Severe	AG, RP	
Livestock equipment	Severe	RP	
Mall – multi-tenant	Moderate		DCVA
Manufacturing plant (not specified)	Moderate		DCVA
Meat packing plant	Severe		RP
Milk processing plant	Severe		RP
Mixing tee with steam and water	Moderate	DCVA	
Mobile home park	Moderate		DCVA
Mop sink faucet with hose bib connection	Moderate	HCVB, AVB	
Mortuary or morgue	Severe		RP
Office building	Moderate		DCVA
Oil refinery	Severe		RP
Paint manufacturing plant	Severe		RP
Penitentiary	Moderate		DCVA
Petroleum processing or storage facility	Severe		RP
Photo lab sink	Severe	AG, AVB, RP	
Pipette washer	Severe	AG, AVB, RP	
Plant using radioactive material	Severe		AG
Plastic manufacturing plant	Severe		RP
Plating shop	Severe		RP
Plating tank	Severe	PVB, RP	
Pleasure boat marina	Severe		RP
Potato peeler	Moderate	AG, AVB	
Pressure washer (no aspirator)	Minor	AG, DCAP	
Pressure washer (with aspirator)	Severe	AG, RP	
Printing plant	Severe		RP
Pump primer line (toxic)	Severe	RP, AG	
Pump primer line (non-toxic)	Moderate	DCAP, DCVA	
Radiator shop	Severe		RP
Refinery, petroleum processing	Severe		RP
Research building	Severe		RP
Residential premises – multi-tenant	Moderate		DCVA
Restricted area	Severe		RP

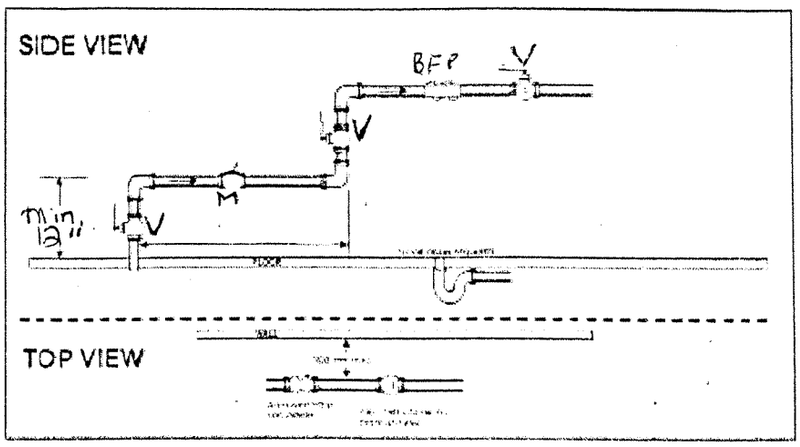
** Premise isolation is required on all sources. Its type will be dependent on the degree of hazard or source isolation that may be present.*

Type of Cross Connection	Degree of Hazard	MINIMUM Source Isolation Device	MINIMUM Premises Isolation Device*
Reverse osmosis	Minor	AG (at drain)	
Reverse osmosis with chemical cleaning	Severe	RP	
School	Moderate		DCVA
Serrated faucet	Severe	AVB, LFVB	
Sewage treatment plant	Severe		RP
Sewage ejector	Severe	AG	
Sewage pump	Severe	AG	
Shampoo sink	Moderate	AVB	
Shopping mall	Moderate		DCVA
Sizing vat	Severe	AG, AVB, PVB, RP	
Solar energy unit	Severe	RP	
Solution tank	Severe	AG, RP	
Specimen tank	Severe	AG, AVAB, PVB Note: Zone RP Protection required	
Steam boiler plant	Minor		RP
Steam table	Moderate	DCAP, AG	
Steam generator	Moderate	DVCA	
Steam cleaner	Moderate	DCVA	
Sterilizer (condensate cooling only)	Severe	AVB, DCAP	
Sterilizer (connection into chamber)	Minor	RP	
Still	Moderate	AG (at drain)	
Storage warehouse	Moderate		DCVA
Swimming pool	Moderate	AG, AVB Note: Zone RP Protection required	
Swimming pool (direct connection)	Moderate	AVB, PVB, DCVA Note: Zone RP protection required	
Swimming pool makeup tank	Moderate	AG, AVB, PVB, DCVA	
Technical institute	Moderate		DCVA
Track-side facilities for trains	Severe		RP
Trap primer	Severe	AG, RP, air gap fitting	
University	Moderate		DCVA
Vegetable sprayer	Moderate	AG, DCAP	
Veterinary clinic	Moderate		DCVA
Veterinary clinic (special equipment)	Severe		RP
Vending machine with carbonator	Moderate	DCAP (stainless steel & plastic)	
Vending machine (with filter)	Minor	DCAP	
Water closet (tank type) (N/A if constructed after 1995)	Moderate	AVB	
Water closet (flushometer type)	Moderate	AVB	
Water hauling equipment (non-toxic)	Moderate	AG, DCVA	
Water hauling equipment (toxic)	Severe	AG	
Water softener, commercial	Minor	DCVA, (AG at drain)	
X-ray equipment	Severe	AG, RP	

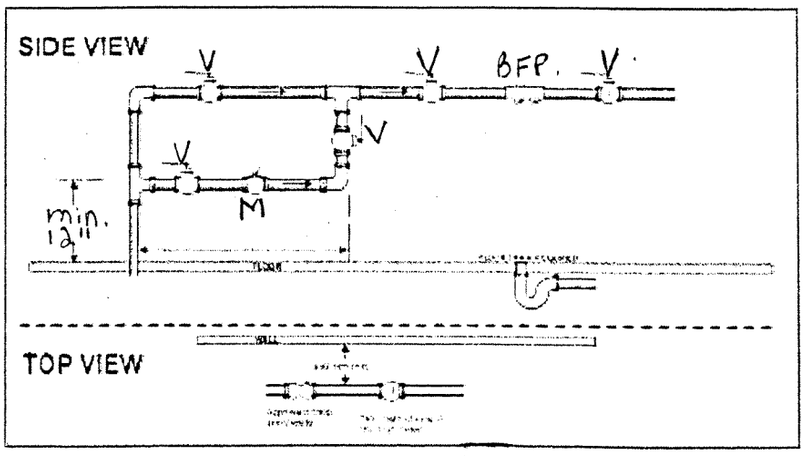
** Premise isolation is required on all sources. Its type will be dependent on the degree of hazard or source isolation that may be present.*

APPENDIX "D"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

INSTALLATION GUIDE



V = Valve
M = Meter
BFP = Backflow Preventer



V = Valve
M = Meter
BFP = Backflow Preventer

Notice: Any deviation to the above Installation Guide must be reviewed and approved by the Manager of Operations or his designate.

APPENDIX "E"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

FOR OFFICE USE

TEST REPORT
Reduced Pressure Principle Backflow Prevention Assembly

Address Location:			Postal Code:
Occupant:	Emergency Contact Person:		Telephone:
Owner:			Telephone:
Address of Owner:			Postal Code
Name of Certified Tester (PRINT):	Tester Cert. #:		Telephone:
Business Name:	Business Address:		Postal Code:
Make of TEST KIT:	Model #:	Serial #:	Date of Last Calibration:
Type of ASSEMBLY:	Model #:	Serial #:	Size:
INSTALL DATE YY MM DD	Location of Assembly (ie. building, room #, installed on what system)		
Premise ☐ Source ☐ Zone ☐	Device Tagged? Yes ☐ No ☐	Antifreeze solution test meets the requirements of NFPA-13 and its amendments? Yes ☐ No ☐	Water Works Valve Lock Removed? Yes ☐ No ☐
TYPE of TEST Initial ☐ Annual ☐ Other ☐	Date of Test YY/MM/DD	SHUT OFF VALVE NO. 2 Leaked ☐ Closed Tight ☐	Line pressure at time of test ___kPa ___psi

	Differential Pressure Relief Valve	Check Valve No. 1	Check Valve No. 2	TEST RESULTS
TEST	☐ Failed to Open ☐ Opened at ___kPa ___ psi	Leaked ☐ Closed Tight ☐ Pressure differential across 1st check valve (no flow) ___kPa ___ psi	Leaked ☐ Closed Tight ☐ Pressure differential across 2nd check valve (no flow) ___kPa ___ psi	Passed ☐ Failed ☐

IF THE ASSEMBLY FAILS THE INITIAL TEST FOR ANY REASON, COMPLETE THIS SECTION AND NOTE REPAIR BELOW:

REPAIRS	Differential Pressure Relief Valve		Check Valve No. 1		Check Valve No. 2		Shut Off Valve No. 2	
	CLEANED	REPLACED	CLEANED	REPLACED	CLEANED	REPLACED	CLEANED	REPLACED
	☐ Disc upper	☐	☐ Disc	☐	☐ Disc	☐	☐ Disc	☐
	☐ Disc Lower	☐	☐ Spring	☐	☐ Spring	☐	☐ Seat	☐
	☐ Spring	☐	☐ Guide	☐	☐ Guide	☐	☐ Other (describe)	☐
	☐ Diaphragm Large	☐	☐ Pin Retainer	☐	☐ Pin Retainer	☐		
	☐ Upper	☐	☐ Hinged Pin	☐	☐ Hinged Pin	☐		
	☐ Lower	☐	☐ Seat	☐	☐ Seat	☐		
	☐ Diaphragm Small	☐	☐ Diaphragm	☐	☐ Diaphragm	☐		
	☐ Upper	☐	☐ Other (describe)	☐	☐ Other (describe)	☐		
	☐ Lower	☐					DATE OF RE-TEST YY/MM/DD	
	☐ Spacer Lower	☐						
	☐ Seat	☐						
	☐ Other (describe)	☐						
RE-TEST	☐ Failed to Open ☐ Opened at ___ kPa ___psi		Leaked ☐ Closed Tight ☐ Pressure differential across 1st check valve (no flow) ___ kPa ___psi		Leaked ☐ Closed Tight ☐ Pressure differential across 2nd check valve (no flow) ___kPa ___ psi		RE-TEST RESULTS Passed ☐ Failed ☐	

Remarks: _____

I certify that I have tested the above assembly in accordance to the City of Pembroke By-Law 2007-24, as amended, and CSA B64.10-94, as amended.

_____ _____

(Signature of Certified Tester) Date: DD/MM/YY

APPENDIX "E"
TO THE CITY OF PEMBROKE
BY-LAW 2007–24

FOR OFFICE USE

TEST REPORT
Double Check Valve Assembly/Pressure Vacuum Breaker

Address Location:			Postal Code:
Occupant:	Emergency Contact Person:		Telephone:
Owner:			Telephone:
Address of Owner:			Postal Code
Name of Certified Tester (PRINT):	Tester Cert. #:		Telephone:
Business Name:	Business Address:		Postal Code:
Make of TEST KIT:	Model #:	Serial #:	Date of Last Calibration:
Type of ASSEMBLY:	Model #:	Serial #:	Size:
INSTALL DATE YY MM DD	Location of Assembly (ie. building, room #, installed on what system)		
Premise ☐ Source ☐ Zone ☐	Device Tagged? Yes ☐ No ☐	Antifreeze solution test meets the requirements of NFPA, and its amendments? Yes ☐ No ☐	Water Works Valve Lock Removed? Yes ☐ No ☐
TYPE of TEST Initial ☐ Annual ☐ Other ☐	Date of Test YY/MM/DD	Line pressure at time of test ___kPa ___ psi	

TEST	Check Valve No. 1		Check Valve No. 2		Pressure Vacuum Breaker		TEST RESULTS
	With Flow ☐Leaked ☐Closed Tight	Against Flow ☐Leaked ☐Closed Tight	With Flow ☐Leaked ☐Closed Tight	Against Flow ☐Leaked ☐Closed Tight	Air inlet Valve ☐Failed to Open	Check Valve ☐Leaked ☐Closed Tight	Passed ☐ Failed ☐
	Pressure drop across check ___kPa ___psi		Pressure drop across check ___kPa ___psi		☐ Opened at ___ kPa ___ psi	Pressure drop across check ___ kPa ___ psi	Slight Tube Test Passed ☐ Failed ☐

IF THE ASSEMBLY FAILS THE INITIAL TEST FOR ANY REASON, COMPLETE THIS SECTION AND NOTE REPAIR BELOW:

REPAIRS	DOUBLE CHECK VALVE ASSEMBLY				Pressure Vacuum Breaker		Date of Re-Test
	Check Valve No. 1		Check Valve No. 2				
	CLEANED	REPLACED	CLEANED	REPLACED	CLEANED	REPLACED	
	☐ Disc upper ☐		☐ Disc upper ☐		☐ Vent Disc ☐		
	☐ Spring ☐		☐ Spring ☐		☐ Vent Spring ☐		
	☐ Guide ☐		☐ Guide ☐		☐ Poppet ☐		
	☐ Pin Retainer ☐		☐ Pin Retainer ☐		☐ Retainer ☐		
	☐ Hinged Pin ☐		☐ Hinged Pin ☐		☐ Spring ☐		
	☐ Seat ☐		☐ Seat ☐		☐ Disc ☐		YY/MM/DD
	☐ Diaphragm ☐		☐ Diaphragm ☐		☐ Guide ☐		
	☐ Other (describe) ☐		☐ Other (describe) ☐		☐ Other (describe) ☐		

RE-TEST	With Flow ☐Leaked ☐Closed Tight	Against Flow ☐Leaked ☐Closed Tight	With Flow ☐Leaked ☐Closed Tight	Against Flow ☐Leaked ☐Closed Tight	Air inlet Valve ☐Failed to open	Check Valve ☐Leaked ☐Closed Tight	RE-TEST RESULTS Passed ☐ Failed ☐
	Pressure drop across check ___kPa ___psi		Pressure drop across check ___kPa ___psi		☐ Opened at ___ kPa ___ Psi	Pressure drop across check ___ kPa ___ psi	

Remarks: _____

I certify that I have tested the above assembly in accordance to the City of Pembroke By-Law 2007-24, as amended, and CSA B64.10-94, as amended.

_____ _____

(Signature of Certified Tester) Date: DD/MM/YY

APPENDIX "F"
TO THE CITY OF PEMBROKE
BY-LAW 2007-24

CERTIFICATE OF COMPLIANCE

Date: _____

Building Address: _____

_____

Owner Name: _____

Occupant Name: _____

Contact Person: _____

Phone #: _____

Tester's Name (Please print): _____

Tester's Certificate Number: _____

Company name: _____

Address: _____

_____

_____

This is to certify that all existing cross connections and required backflow prevention methods and devices at the above-noted address comply with the City of Pembroke Cross Connection/Backflow Prevention By-law # 2007-24 and amendments thereto.

Signature of Owner: _____

Tester's Signature: _____