

How to choose an appropriate backflow prevention device for your property

The Canadian Standards Association publishes a standard (CAN/CSA B64) for the selection, installation, and maintenance of backflow prevention devices. Premise isolation can be achieved by installation of an appropriate backflow prevention device such as a Double Check Valve Assembly device or a Reduced Pressure Principle Assembly device. The appropriate device for any given service connection will depend on the type of risk.

What is a Double Check Valve Assembly?

A Double Check Valve Assembly (DCVA) is a mechanical backflow prevention device that consists of two internally-loaded check valves, two shut-off valves and four test cocks. It is used to prevent backflow caused by backpressure or backsiphonage, where a minor or moderate hazard exists. With its two check valves in a series, the DCVA prevents backflow even if one check valve fails. It is typically installed in schools and universities, multi-residential/condominium buildings, swimming pools, veterinary clinics, and other such properties.



Typical DCVA – for reference only

What is a Reduced Pressure Principle Assembly?

A Reduced Pressure Principle Assembly (RP) is a mechanical backflow prevention device that consists of two shut-off valves, four test cocks and two independently-acting, internally-loaded check valves separated by a reduced pressure zone. During normal operation, the pressure between the two check valves is maintained at a lower pressure than the water supply system's pressure. If either check valve should leak, a relief valve maintains a differential pressure of not less than 14 kPa between the supply pressure and the reduced pressure zone by discharging water through the relief port. It is used to prevent backflow for up to and including severe hazards found at ICI properties. This device is commonly installed in chemical manufacturing companies, wastewater treatment plants, car washes and automotive garages, food processing plants, hospitals, dental clinics, mortuaries, and other such properties.



Typical RP – for reference only

Who can conduct surveys or test backflow prevention devices?

Backflow prevention devices can have wear and tear, and must be tested at a minimum of once every year to make sure they are working properly. These devices can only be tested by a certified tester who:

- Holds a currently valid Certificate of Achievement in Cross Connection Control endorsed by Ontario Water Works Association; and
- Holds a current calibration certificate for the test equipment to be employed; and
- Is a professional engineer, engineering technologist, licensed plumber, etc.

Please refer to Schedule 6 of the water supply by-law which lists the qualification that a tester, installer or surveyor must possess in order to work on premise isolation backflow devices. Additional information about certified testers and a link to Schedule 6 of the Water Supply Bylaw can be found at www.toronto.ca/water/protecting_quality/backflow_prevention/testers.htm.

Offences and penalties

It is an offence to break or violate any provision under the City's Water Supply Bylaw. Doing so subjects a property owner to prosecution and fines.

More information

To learn more about the City's Backflow Prevention Program and download the complete Water Supply By-law visit www.toronto.ca/water/protecting_quality/backflow_prevention/index.htm.

You can also email backflow@toronto.ca or call 416-394-8888 for more information.

Backflow Prevention Program

Important information

for industrial, commercial, institutional and multi-residential properties

For more information and/or inquiries about the Backflow Prevention Program, call 416-394-8888, email backflow@toronto.ca or visit www.toronto.ca/water/backflow

For general information about Toronto Water visit www.toronto.ca/water

For water related emergencies, backflow incidents or non-compliance please call **3-1-1**



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Responsibilities of the owners of Industrial, Commercial, Institutional (ICI) and Multi-residential Properties >

In order to ensure continual delivery of safe, clean drinking water to all Toronto residents and businesses, the City of Toronto Division has strict criteria under which property owners are allowed to connect to the City's water supply system. Protecting drinking water quality is a top priority and the installation of backflow prevention devices (at industrial, commercial, institutional and some multi-residential properties) can prevent possible contamination, where such a risk exists.

What is backflow?

The water distributed through the City's water supply system is under constant and high pressure. In addition to maintaining the quality of the water, this pressure is necessary to move the water throughout the system and the hundreds of thousands of water service connections. (A water service connection is where the City's distribution pipes, watermains, connect with the private plumbing of homes and businesses.)

Backflow is the undesired reversal of water flow against normal direction that occurs as a result of backpressure or backsiphonage.

Backpressure results when the pressure in private water system is higher than the pressure in the City's water supply system. An example of this situation occurs when industries use pumps to circulate cooling water for equipment. Backsiphonage can occur when there are dips in pressure in the system. An example of this situation is when there is a watermain break.

If chemicals, pollutants, toxic substances, bacteria, pathogens, and non-potable water are in the property's water supply system, they may enter the public water supply system due to backflow. This may result in contamination of the public drinking water supply.

Water Supply Bylaw

On October 22, 2007 Toronto City Council passed Municipal Code Chapter 851 (Water Supply Bylaw). The bylaw is an amalgamation of all the old water supply bylaws under the former municipalities. It also includes improvements for the protection of Toronto's water supply system. Additionally, the bylaw promotes water conservation and the installation of backflow prevention devices at the water service connections to prevent contamination risks. This comprehensive bylaw came into effect on January 1, 2008.

Preventing backflow at the source

Prevention of backflow at the water service connection is known as premise isolation. In other words, the isolation of the private water system within a building, structure or property from the City's water supply system can be achieved by installing a backflow prevention device immediately after the water meter.



If an ICI or multi-residential property has on-premise operations/activities that involve the use of chemicals and other substances that can contaminate the water supply system (refer to Schedule 5 of the bylaw), the property owner is responsible for ensuring compliance with the new bylaw. This includes:

- A Building Permit must be obtained for the installation of all premise isolation backflow devices regardless of the water service connection size.
- Installation of an appropriate backflow prevention device at each water service connection that poses a risk to the water supply system. This measure must be completed by an authorized person specified in the Water Supply Bylaw, at the property owner's expense. Two types of backflow prevention devices provide effective premise isolation depending on the level of risk—a Reduced Pressure Principle Assembly (RP) device or a Double Check Valve Assembly (DCVA) device. Each device needs to be installed immediately after the water meter in order to successfully "isolate the premise", and at a distance from the meter in accordance with the standards and specifications appropriate to the device.
- Ensuring that:
 - > The backflow prevention device is tested by a certified tester at the time of initial installation and thereafter at least once a year.
 - > The backflow prevention device is tested by a certified tester within 72 hours after the device has been cleaned, repaired, replaced, serviced or overhauled.

- > The backflow prevention device has a legibly marked tag on each device with the information specified in the Bylaw (see Section 8 D (9) of the bylaw).
- > Piping between the water meter and the backflow prevention device is clearly labelled with the words "no connection permitted".
- > Submitting test results to the City within seven (7) days of device testing.
- > Copies of any records submitted to the City are maintained on-site (at the property) for a minimum seven (7) years.
- When required, ensuring an on-site survey is conducted to determine if all water service connections at the property are properly evaluated for any potential risks that may cause backflow to enter into the public water supply system.
 - > When such a survey is deemed a requirement, the owner must ensure the backflow prevention survey is submitted to the City. Additionally, the survey will need to be updated at least once every five (5) years.
- Using the survey and testing forms developed by the City of Toronto when reporting survey and test results. These forms **must** be used and can be downloaded at www.toronto.ca/water/protecting_quality/backflow_prevention/forms.htm.
- Notifying the City of any change in hazard (e.g. a change in the building's operations/activities, to the service connection, etc.).