

Backflow Prevention Frequently Asked Questions

What is backflow?

Backflow is the undesired, reversed flow of water in water lines that can contaminate drinking water. The City of Boulder controls water quality up to the point of a private property. After this point, water quality can be degraded or contaminated within a private property. When backflow occurs, water from inside a private property can be pushed or pulled back into the community's drinking water supply. On a smaller scale, backflow can be isolated within a single property when water from a source, like a sprinkler system, pushes or pulls water back into the property's drinking water supply.

What causes backflow?

Backflow occurs when water is pushed (backpressure) or pulled (backsiphonage). Backpressure is caused when the force of water at a private property overcomes city water pressure. Generally, backpressure is attributed to pumps, but can also be caused by tall buildings (due to the height and weight of the given column of water). Backsiphonage occurs when a "reverse siphon" is caused due to pressure loss or fluctuation. Generally, water main breaks or large water uses, like operating fire hydrants, can cause backsiphonage to occur. Backflow prevention assemblies are used to help prevent backpressure and/or backsiphonage.

What is a cross-connection?

A cross-connection is a direct physical connection between a potable water source and a non-potable water source. A cross-connection is a point where backflow can occur. The terms "cross-connection" and "backflow prevention" are often used interchangeably, despite their subtle differences in meaning.

What is an air gap?

An air gap provides space between the source of water and the overflow/flood level of the area being filled, allowing the free flow of water through air. This distance prevents a cross-connection by providing a physical separation between the water source and its destination. The tub spout that fills a bathtub is considered an air gap because the spout is set above the level to which the tub could flood. The air gap, or space between the water level and the spout, keeps soapy/dirty water in the bathtub from being siphoned back into your drinking water.

In general, an air gap must be at least two times the diameter of the filling pipe above the maximum water level that can be reached by the receiving container. For example, a two-inch pipe must have an air gap of four inches above the flood rim. A 0.75-inch drain on a water heater must have an air gap of at least 1.5 inches above the drain. Some conditions require increased air gap separations, so always consult the plumbing code when installing an air gap.

What is a backflow prevention assembly?

A backflow prevention assembly (also known as a backflow preventer) is a mechanical device that is installed on your domestic plumbing service. Once installed and tested, rubber checks and springs inside of the backflow prevention assembly will prevent any water from flowing in the reverse direction. Backflow prevention assemblies must be tested annually.

What are the Backflow Prevention Program requirements?

Both the Boulder Revised Code and State of Colorado regulations ([Regulation 11- Section 39](#)) require that backflow prevention assemblies be installed and tested annually by a certified backflow prevention tester. The City of Boulder sends letters notifying customers

of their duty to test their assemblies. If no action is taken, the city may shut off water service until a backflow test can be scheduled, passed and verified by the Backflow Prevention Program.

I received a letter to test my backflow prevention assembly, what do I need to do?

If you received a letter from the City of Boulder Backflow Prevention Program, you must have your backflow prevention assembly tested by a certified backflow prevention tester and submit the test results to the Backflow Prevention Program.

What types of water service lines require backflow prevention? Who must comply? Currently, both the City of Boulder and the State of Colorado require commercial, industrial and multifamily (more than eight units) users to comply. Because these properties have larger service lines (and therefore pose a greater public safety hazard), they are required to have backflow prevention assemblies installed.

In general, all domestic, fire and dedicated irrigation lines must have backflow prevention assemblies installed to comply with the city's Backflow Prevention Program. However, backflow prevention may be required under other circumstances in which the City of Boulder determines that the property represents a high hazard. In some cases, residential customers with high hazards (such as well water) may be required to install backflow prevention assemblies and have the assemblies tested annually.

How can I find a certified backflow prevention tester?

The Backflow Prevention Program cannot recommend testers. However, you can find a backflow prevention tester by contacting your current plumber or contractor, looking in the phone book under "Backflow" or by searching online. The [American Backflow Prevention Association](#) has a list of [certified Colorado backflow prevention testers](#) available on its website. [The Backflow Prevention Education Council of Colorado](#) can also help you [find a tester](#). Testing costs will vary between the different testing companies.

Where should the backflow prevention assembly be installed?

The backflow prevention assembly must be installed between the water meter and the first private plumbing branches. This is known as the point of containment.

How do I know if my property has a backflow prevention assembly?

You can check to see if you have a backflow prevention assembly by looking at where water enters your property (usually in a basement by the water heater, a crawl space, or in a mechanical room). If you don't know what a backflow prevention assembly looks like or are unsure, call your plumber, contractor or another professional who can identify whether or not you have a backflow prevention assembly.

How much does a backflow prevention assembly cost?

Prices vary significantly depending on the brand and where the assembly is purchased from.

How much does it cost to have a backflow prevention assembly installed?

Since there are so many variables, such as pipe size, pipe type, location of installation, backflow prevention assembly size and type, availability of a drain, and the plumber's individual pricing, the City of Boulder cannot provide an estimate of the installation cost. However, it is advised that you get at least three quotes so that you can compare installation costs.