



**CITY OF GUNNISON
BACKFLOW PREVENTION AND CROSS- CONNECTION
CONTROL PROGRAM**

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1-1: PURPOSE AND APPLICATION

This Chapter is promulgated to implement the City’s program for control of cross connections and requirements for containment devices which include, but are not limited to, double check and reduced pressure assemblies and Approved Backflow Prevention Assemblies, and to meet requirements of state regulation NO. 11 (11.39) Colorado Primary Drinking Water Regulations (5 CCR 1002-11)

1-2: REQUIREMENTS

- (A)** The City shall take steps to identify potentially uncontrolled hazardous service cross connections.
- (B)** All water system customers shall install, maintain, and replace City approved containment devices on any uncontrolled hazardous service connection consistent with the degree of hazard imposed by the uncontrolled cross connection in accordance with guidelines established by the Colorado Department of Public Health and Environment.
- (C)** The installation of all containment devices shall be approved by the City following installation, prior to use.

- (D) Containment devices shall be properly inspected or tested and maintained by the customer, at the customer's expense at installation and at least annually by a certified cross connection control technician. Test results shall be submitted to the City.
- (E) The City shall retain maintenance and inspection records of containment devices for three (3) years, which shall be available for inspection by Colorado Department of Public Health and Environment personnel.
- (F) The City shall notify Colorado Department of Public Health and Environment of any cross connections discovered by the City, as defined by Regulation NO.11 (11.39) of the State regulations, and require correction of the problem with due diligence.
- (G) City customers shall comply with applicable City ordinance 5, and Section 608.13 to 608.17 of the International Plumbing Code, to properly install and maintain containment devices, and to perform annual inspections and tests, provide the City with inspections and test reports, and maintain a copy of their inspections and test reports.

City customers shall have their irrigation containment device tested and repaired if needed before the system being placed on line.

1-3 COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT CROSS CONNECTION CONTROL MANUAL

The City may utilize provisions of the Colorado Department of Public Health and Environment's Cross Connection Control Manual to identify hazardous service connections, determine required containment devices for various types of installation, and assist in administration and interpretation of the program and interpretation.

1-4: GENERAL REQUIREMENTS

- (A) All new construction of commercial & Multi-Family units shall have a reduced pressure backflow assembly engineered & designed and installed in the City of Gunnison.
- (B) All existing commercial & Multi-Family buildings must install a reduced pressure assembly and install a high water censer were proper drainage cannot be established.
- (C) Plumbing plans must be submitted to the City and approved, prior to the activation of water service. PLANS MUST SHOW:
 - (1) Water services type, size and location
 - (2) Meter size and location

- (3) Backflow prevention assembly size, type and location
- (4) Fire sprinkling system(s) service line, size and type of backflow prevention assembly if applicable

- (D)** Backflow prevention assemblies are to be installed in an accessible location to facilitate maintenance, testing and repair.
- (E)** All backflow prevention assemblies shall be installed immediately downstream of the water meter.
- (F)** Before installing a backflow prevention assembly, pipelines should be thoroughly flushed to remove foreign material.
- (G)** In no case will it be permissible to have connections or tees before the meter and between the meter and service line backflow prevention assembly.
- (H)** Backflow prevention valves are not to be used as the inlet or outlet valve of the water meter. Test cocks are not to be used as supply connections.
- (I)** In order to insure that backflow prevention assemblies, continue to operate satisfactorily, it will be necessary that they be tested at the time of installation and then on an annual schedule thereafter.
- (J)** The City will require inspection of all containment system installations.
- (K)** All costs for design, installation, maintenance, repair, and testing are to be borne by the customer.
- (L)** No grandfather clause exists. All laws and regulations apply regardless of the age of the facility.
- (M)** All fire sprinkling lines shall have a minimum protection of an approved double check valve for containment of the system.
- (1) All glycol, ethylene, propylene, and other chemical antifreeze systems shall have an approved Reduced Pressure Zone assembly for containment.
 - (2) Dry fire systems shall have an approved Double Check Valve installed upstream of the air pressure valve.
 - (3) Single-family residence with a fire sprinkler system and domestic water combined shall have a double check valve when no chemicals are used. If chemicals are used a Reduced Pressure assembly will be needed.

- (N) All fire sprinkler systems shall conform to the following sections of the National Fire Protection Association Pamphlets Number Thirteen and Twenty-Four: Pamphlet Number Thirteen, section 1-11.2 Hydrostatic Testing, and section 1-1.2.2 Allowable Leakage and Pamphlet Number Twenty-Four, "Private Fire Service Mains and Their Appurtenances", Section 8.4.

1-5: STANDARDS FOR BACKFLOW PREVENTION ASSEMBLIES

- (A) Any backflow prevention assembly required for containment under this Chapter shall be of a model and size approved by the City. The term "Approved Backflow Prevention Assembly" shall mean an assembly that has been manufactured in full conformance with the standards established by the latest version of the Colorado Department of Public Health and Environment Cross Connection Control Manual and by the City. Final approval shall be evidenced by a "Certificate of Approval" issued by an approved testing laboratory certifying full compliance with Colorado Department of Public Health and Environment standards and A.S.S.E. and/or USC FCCC & HR specifications. Provided however, containment within a residential meter pit may be accomplished with an assembly not approved by the Foundation for Cross Connection Control and Hydraulic Research, but approved by the American Society of Sanitary and Mechanical Engineers as designated by the City. The following testing laboratory is qualified to test and certify backflow prevention assemblies. A backflow prevention assembly being listed on their periodic approved list shall be deemed to meet all of the above requirements:

A.S.S.E. American Society of Sanitary Engineering, 28901 Clemens Road,
Suite 100, Westlake, Ohio 44145.

USC Foundation for Cross-Connection Control and Hydraulic Research,
University of Southern California, OHE 430-D University Park-MC 1453 Los
Angeles, California 90089- 14534.2

- (1) Only Approved Backflow Prevention Assemblies shall be used.

- (B) Containment devices and backflow prevention assemblies currently installed, which are not approved, shall be replaced with an approved device at the time they are discovered.
- (C) Backflow prevention assemblies used on fire lines shall have O.S.&Y. (outside stem & yoke) valves and be listed by the National Fire Protection Association.

1-6: INSTALLATION OF CONTAINMENT DEVICES

- (A) Backflow prevention assemblies shall be installed in accordance with all City

requirements.

- (B)** All backflow prevention assembly installations shall be inspected and approved for use by the City.
- (C)** All backflow prevention assemblies shall be installed in the horizontal position. Vertical installation shall be acceptable when approved by A.S.S.E. and / or USC FCCC & HR specifications.
- (D)** A pressure vacuum breaker shall be used where the backflow prevention assembly is never subject to backpressure if installed a minimum of twelve (12) inches above the highest piping or outlet downstream of the assembly in a manner to preclude back pressure. Atmospheric vacuum breakers are not allowed as containment devices. A single check valve is not considered to be a backflow prevention assembly, and must be replaced with an approved containment device.
- (E)** Double check valve assemblies may be installed in below grade vaults only if the vault is properly constructed, doesn't leak and insulated to prevent freezing.
- (F)** Reduced pressure backflow prevention assemblies must be installed above ground. The device should be placed at least twelve inches (12) above the finish grade to allow clearance for the repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location provided it is readily visible from above grade and provided the relief valve is separated from the drain line by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances and adequate drainage.
- (G)** No type of backflow assembly can be installed in a location that the device will be submerged in water or a chemical at any time.

SMALLER PLUMBING SYSTEMS MAY REQUIRE THE INSTALLATION OF A PRESSURE EXPANSION TANK OR SPECIAL PRESSURE RELIEF VALVE TO ALLOW FOR EXCESSIVE PRESSURE BUILD-UP WITHIN THE SYSTEM CAUSED BY WATER HEATERS, BOILERS, ETC.

1-7: TESTING AND MAINTENANCE

- (A)** At least once per year, it will be the duty of the customer where any containment device is installed to have a certified inspection or test made of those devices. In those specific instances where the City deems the hazard to be great enough, certified inspections or tests at more frequent intervals may be required. These inspections or tests shall be at the expense of the customer and shall be performed by a certified technician approved by the Colorado Department of Public Health and Environment.
- (B)** As necessary, the containment devices shall be repaired or replaced at the expense of the customer whenever the containment device is found to be defective. Records of all such inspections, tests, repairs or replacement shall be kept by customer and the City.
- (C)** Existing containment devices shall be sealed by the technician performing the inspection or test at the completion of the inspection or test.
- (D)** All testing equipment used in testing of containment devices shall be checked for accuracy at least annually, and proof of compliance shall be submitted to the City upon request.
- (E)** The City retains the right to inspect or test the installation and operation of any containment device at any time to assure proper operation.

1-8: SPRINKLER SYSTEMS BACKFLOW DESIGN REQUIREMENTS

All sprinkler systems must be equipped with a backflow preventer. There are two different types of backflow preventers to choose from. PVB and RPB backflow preventers must be tested annually by a state-certified tester. The Cross Connection Control Coordinator has a list of approved backflow preventers since not all devices sold locally are approved for use.

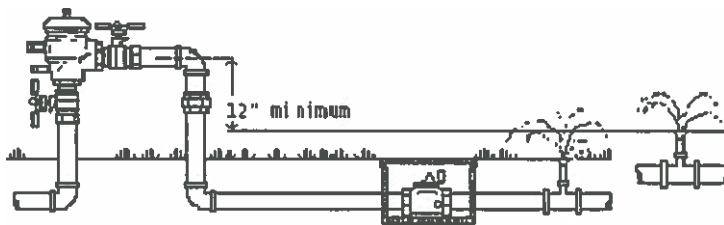
Pressure Vacuum Breaker Assembly (PVB)

Only one PVB is required to serve the whole system. Control valves may be located downstream of (after) the PVB.

PVBs must be installed a minimum of 12" above the highest point of water they serve. PVBs must be tested by a state-certified tester at the time of installation, annually, and when moved or repaired.

No chemical or fertilizer may be introduced into an irrigation system equipped with PVBs.

No pumps or backpressure sources are permitted on the downstream side of (after) a PVB.



Reduced Pressure Backflow Assembly (RP)

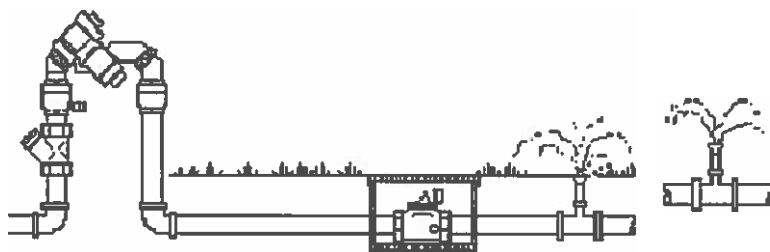
Only one RP is required to serve the whole system; control valves can be located downstream of (after) the RP.

RPs must be installed a minimum of 12" above ground level.

RPs must be tested by a state certified backflow preventer tester at the time of installation, annually, and when moved or repaired.

In an RP-equipped system, fertilizer and other agricultural chemicals may be introduced downstream of (after) the RP.

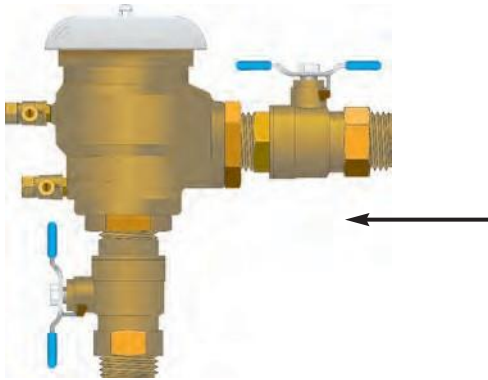
Basement installations are all right as long as proper drainage and high water alarms exist.



Maximum design flow for residential systems on a 3/4-inch service and meter should not

exceed 15 gallons per minute (gpm). Higher flows can damage the meter. All devices should be installed in a manner that allows adequate clearance for testing a

Pressure vacuum breaker assembly (PVB)



This assembly provides protection against potentially high hazard situations. The PVB is designed to protect the water system from siphoning material into the water supply, and **may be** used under continuous pressure.

Reduced Pressure Assembly (RP)

High hazard applications where health and hazard conditions exist such as a chemical solutions or dual pipe systems.



1-9: ENFORCEMENT AND PENALTY

This Program shall be enforced and administered pursuant to applicable provisions of the City Code, City Building Code and the International Plumbing Code, including but not limited to, rights of entry and inspection, water shut-off, abatement of nuisances, and prosecution in municipal court. It shall be unlawful for any person to violate any of the provisions of this Chapter. Any person convicted of such violation may be punished as provided law. Each separate day on which a violation is committed or continues shall constitute a separate offense.

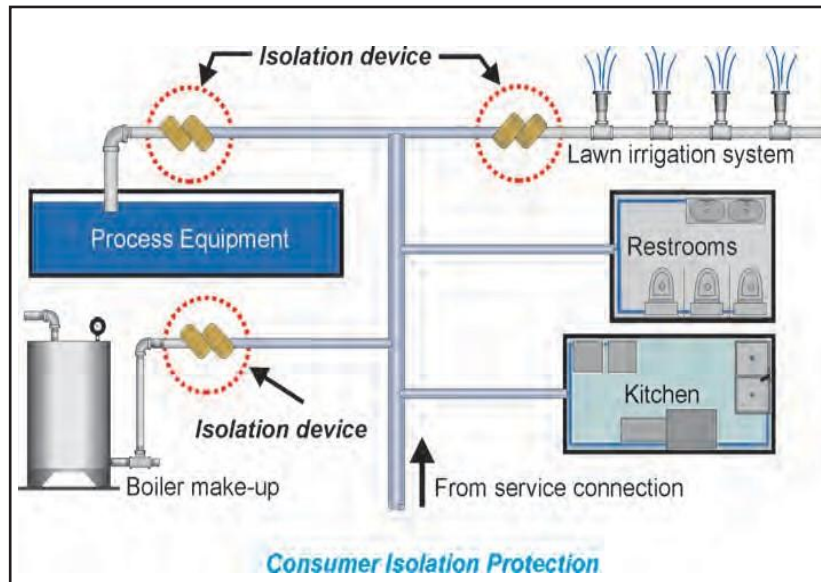
The water utility will protect the quality of water supplied to consumers by asking them to install backflow prevention assemblies at their service connections when needed. The chart below describes types of protective assemblies to be installed on certain types of business establishments. This is not a complete list and can be up dated by the city at any time in the future.

Containment Program TYPE OF WATER CONSUMER	Assembly Type
All new commercial facilities and Multi-family residences	AG or RP
Any consumer with a backflow history	AG or RP
Automotive service station or repair shop	AG or RP
Building taller than 40 ft.	AG or RP
Car Wash	AG or RP
Commercial Auxiliary water system	AG or RP
Fire line - no chemicals	AG, RP or DC
Fire line - Chemicals added	AG or RP
Food processing/packing plant	AG or RP
Grocery Stores	AG or RP
Greenhouse	AG or RP
Hair salon - Spa	AG or RP
Hospital and long-term care facility	AG or RP
Hotel & lodging	AG or RP
Kennel - boarding only	AG or RP
Laboratory - clinical & chemical	AG or RP
Laundry and cleaning service	AG or RP
Manufacturing and industrial facility	AG or RP
Medical - Dentist - Veterinary office	AG or RP
Morgue and mortuary	AG or RP
Restaurant	AG or RP
School with laboratory	AG or RP
Sewage treatment plant	AG or RP
Shell business development space - Strip Mall	AG or RP

SMALLER PLUMBING SYSTEMS MAY REQUIRE THE INSTALLATION OF A PRESSURE EXPANSION TANK OR SPECIAL PRESSURE RELIEF VALVE TO ALLOW FOR EXCESSIVE PRESSURE BUILD-UP WITHIN THE SYSTEM CAUSED BY WATER HEATERS, BOILERS, ETC.

Through Gunnison’s Cross-Connection Control program, the water utility will only contain a consumer’s plumbing system at the water meter. In other words, if an accident should occur, the City’s water supply will be protected from anything that may flow backwards through the internal plumbing system and into the City’s main water pipeline.

It is very important for you, the owner of your plumbing system, to take necessary precautions for protecting your internal plumbing system. This type of protection is called **isolation protection**.



Although your plumbing system may have been constructed with great care in the past, changes in technology and safety concerns may have created the need for additional protection for your system with special backflow prevention assemblies. The City of Gunnison’s Building Inspection Division can assist you with isolating and protecting plumbing systems within your building.

Isolation protection will be each consumer's responsibility.

The **Isolation Program** will not be regulated by the City, and are presented here for consideration and assistance in developing individual isolation protection within a facility. This chart is provided to offer some suggestions regarding the type of protective assembly that should be installed on your plumbing fixtures, to protect your drinking water supply.

Isolation Program	Assembly Type
TYPE OF WATER USAGE	
Air conditioned cooling tower	RP
Boiler - industrial feed line	RP
Chemical feeder tank	RP
Coffee urn - cooking kettle	AVB
Degreasing equipment	RP
Dishwasher	AVB or PVB
Drinking fountain	AG
Etching tan	RP
Hydro-therapy bath	AVB
Irrigation system	RP or PVB
Ornamental fountain	RP
Re-circulated water	RP
Soap mixing tank	AVB
Ultrasonic cleaner	AVB

It is important for the consumer to be aware of certain types of potentially dangerous connections that can be made to the water system. Care must be taken to insure that these types of connections are properly protected for the safety of your internal plumbing system and consumers.

This is **not** a complete list. Each type of backflow preventer has certain installation limitations. Consult your plumbing contractor for the proper backflow preventer and installation for your system. A backflow preventer must be tested upon installation, after any repairs and annually to ensure that it is functioning properly.