Water Supply and Distribution – Cross Connection

excerpts from TNRCC regulations:

601.0 Running Water Required

601.1 Except where not deemed necessary for safety or sanitation by the Administrative Authority, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed by means of an approved flush tank or flush-o-meter valve. In jurisdictions which adopt Appendix J, water closets, urinals, and trap primers in designated non-residential buildings may be provided with reclaimed water as defined and regulated by Appendix J of this Code.

601.2 Faucets and diverters shall be connected to the water distribution system so that hot water corresponds to the left side of the fittings.

602.0 Unlawful Connections

602.1 No installation of potable water supply piping or part thereof shall be made in such a manner that it will be possible for used, unclean, polluted or contaminated water, mixtures, or substances to enter any portion of such piping from any tank, receptacle, equipment, or plumbing fixture by reason of back-siphonage, by suction or any other cause, either during normal use and operation thereof or when any such tank, receptacle, equipment, or plumbing fixture is flooded, or subject to pressure in excess of the operating pressure in the hot or cold water piping.

602.3 No person shall make a connection or allow one to exist between pipes or conduits carrying domestic water supplied by any public or private water service system, and any pipes, conduits, or fixtures containing or carrying water from any other source or containing or carrying water which has been used for any purpose whatsoever, or any piping carrying chemicals, liquids, gases, or any substances whatsoever, unless there is provided a backflow prevention device approved for the potential hazard.

602.4 No plumbing fixture, device, or construction shall be installed or maintained or shall be connected to any domestic water supply when such installation or connection may provide a possibility of polluting such water supply or may provide a cross-connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard.

602.5 No water piping supplied by any private water supply system shall be connected to any other source of supply without the approval of the Administrative Authority, Health Department, or other Department Having Jurisdiction.

603.0 Cross-Connection Control

Cross-connection control shall be provided in accordance with the provisions of this chapter.

No person shall install any water operated equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

Approval of Devices or Assemblies. Before any device or assembly is installed for the prevention of backflow, it shall have first been approved by the Administrative Authority. Devices or assemblies shall be tested for conformity with recognized standards or other standards acceptable to the Administrative Authority which are consistent with the intent of this Code.

All devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. The Administrative Authority or other department having jurisdiction may inspect such devices or assemblies and, if found to be defective or inoperative, shall require the repair or replacement thereof. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the Administrative Authority.

603.1 Backflow Prevention Devices, Assemblies, and Methods

603.1.1 Air-gap. The minimum air-gap to afford backflow protection shall be in accordance with Table 6-2.

603.1.2 Atmospheric Vacuum Breaker (AVB). An atmospheric vacuum breaker consists of a body, a checking member and an atmospheric opening.

603.1.3 Double Check Valve Backflow Prevention Assembly (DC). A double check valve backflow prevention assembly consists of two independently acting internally loaded check valves, four properly located test cocks and two isolation valves.

603.1.4 Pressure Vacuum Breaker Backflow Prevention Assembly (PVB). A pressure vacuum breaker backflow prevention assembly consists of a loaded air inlet valve, an internally loaded check valve, two properly located test cocks and two isolation valves.

603.1.5 Reduced Pressure Principle Backflow Prevention Assembly (RP). A reduced pressure principle backflow prevention assembly consists of two independently acting internally loaded check valves, a differential pressure relief valve, four properly located test cocks and two isolation valves.

TABLE 6-2 Backflow Prevention Devices, Assemblies and Methods

Device, Assembly or Method[1]	Degree of Hazard				Installation[2,3]
	Pollution (Low Hazard)		Contamination (High Hazard)		
	Back-Siphonage	Back-Pressure	Back-Siphonage	Back-Pressure	
Air-gap	x		x		See table in this chapter.
Atmospheric Vacuum Breaker	x		x		Upright position. No valves Downstream. Minimum of six (6) inches (152.4 mm) or listed distance above all downstream piping and flood level rim of receptor.[4,5]
Double Check Valve Backflow Preventer	X	x			Horizontal, unless otherwise listed. Requires one (1) foot (0.3 m) minimum clearance at bottom for Maintenance. May need Platform/ladder for test and repair. Does not discharge water.
Pressure Vacuum Breaker	X		x		Upright position. May have valves Downstream. Minimum of twelve (12) inches (0.3 m) above all downstream Piping and flood level rim of receptor. May discharge water.
Reduced Pressure Principle Backflow Preventer	x	x	x	X	Horizontal unless otherwise listed. Requires one (1) foot (0.3 m) minimum clearance at bottom for Maintenance. May need Platform/ladder for test and repair. May discharge water.

[1] See description of devices and assemblies in this chapter.
[2] Installation in pit or vault requires previous approval by the Administrative Authority.
[3] Refer to general and specific requirements for installation.
[4] Not to be subjected to operating pressure for more than 12 hours in any 24 hour period.
[5] For deck-mounted vacuum breakers, see Section 603.3.14.

603.2 General Requirements

603.2.1 All assemblies shall conform to listed standards and be acceptable to the Administrative Authority having jurisdiction over the selection and installation of backflow prevention assemblies.

603.2.2 The premise owner or responsible person shall have the backflow prevention assembly tested by a certified backflow assembly tester at the time of installation, repair, or relocation and at least on an annual schedule thereafter or more often when required by the Administrative Authority.

603.2.3 Access and clearance shall be provided for the required testing, maintenance and repair. Access and clearance shall require a minimum of one (1) foot (0.3 m) between the lowest portion of the assembly and contamination

or pollution may be installed in accordance with the requirements for that type of device or assembly as set forth in this chapter.

603.3.6 Lawn Sprinkling Systems shall be equipped with listed atmospheric vacuum breakers installed on the discharge side of each of the last shutoff valves. Where atmospheric vacuum breakers cannot be installed because of piping elevation or valves, other listed backflow preventers shall be installed in accordance with their requirements as set forth in this chapter.

603.3.7 Potable Water Outlets with Hose Attachments other than water heater drains and clothes washer connections shall be protected by a listed non-removable hose bibb type backflow preventer or by a listed atmospheric vacuum breaker installed at least six (6) inches (152.4 mm) above the highest point of usage and located on the discharge side of the last valve. In climates where freezing temperatures occur, a listed self-draining frost proof hose bibb with an integral backflow preventer shall be used.

603.3.8 Water Cooled Compressors, Degreasers or any other water-cooled equipment shall be protected by a listed backflow preventer installed in accordance with the requirements of this chapter.

Note: Some water-cooled equipment may produce backpressure and shall be equipped with the appropriate protection.

603.3.9 Water Inlets to Water Supplied Aspirators shall be equipped with a listed atmospheric vacuum breaker mounted at least six (6) inches (152.4 mm.) above the aspirator unit or equipped with a listed backflow preventer installed in accordance with its listing requirements and this chapter. The discharge shall drain through an air-gap. When using the tailpiece of a fixture to receive the discharge of an aspirator, the air-gap shall be located above the flood level rim of the fixture.

603.3.10 Potable Water Make Up Connections to Steam or Hot Water Boilers shall be provided with a listed backflow protection assembly.

603.3.11 Non-potable Water Piping. In cases where it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a non-potable water line. No drinking or domestic water outlets shall be connected to the non-potable water line. Whenever possible, all portions of the non-potable water line shall be exposed and all exposed portions shall be properly identified in a manner satisfactory to the Administrative Authority. Each outlet on the non-potable water line which may be used for drinking or domestic purposes shall be posted: "DANGER - UNSAFE WATER".

603.3.12 Potable Water Supply to Carbonators. Shall be protected by a listed reduced pressure principle backflow preventer as approved by the Administrative Authority for the specific use.

603.3.13 Backflow Preventers shall not be located in any area containing fumes that are toxic, poisonous or corrosive.

Adopted June 1999 by Acton Municipal Utility District