

## SECTION 12

### CROSS CONNECTIONS AND BACKFLOW PREVENTION

#### 12-1 GENERAL

Cross connection and backflow prevention is covered in Section 10-2 Article 6 of the Municipal Code. This Municipal Code section is made a part of the appendix.

#### 12-2 JURISDICTION, AUTHORITY, REFERENCES

The City of Thousand Oaks' requirements for backflow prevention are covered in Section 10-2 of the Municipal Code, and by reference in that section, the City has adopted the regulations of the California Department of Public Health, Title 17 of the California Administrative Code. The developer/contractor should be familiar with the applicable sections of the Municipal Code.

The Cross Connection Control Officer for the City is an individual within (or on contract with) the Public Works Department, who is responsible for ensuring that the devices are properly installed, maintained and tested. The various protective devices are to be installed, maintained and tested by and at the expense of the property owner.

#### 12-3 TYPES OF BACKFLOW PREVENTION

There are several different types of backflow prevention devices. The type of backflow prevention device to be used must be approved by the City's Cross Connection Control Officer prior to installation. Descriptions of each device are as follows:

12-3.1 Air Gap: An Air Gap is a physical separation of the supply pipe by at least two pipe diameters (never less than one inch) vertically above the overflow rim of the receiving vessel. In this case line pressure is lost. Therefore, a booster pump is usually needed downstream, unless the flow of the water by gravity is sufficient for the water use. With an air gap there is no direct connection between the supply main and the equipment. An air gap may be used to protect against a contaminant or a pollutant, and will protect against both backsiphonage and backpressure. An air gap is the only acceptable means of protecting against lethal hazards.

12-3.2 Reduced Pressure Principle Assembly (RP): This assembly consists of two internally loaded independently operating check valves and a

mechanically independent, hydraulically dependent relief valve located between the check valves. This relief valve is designed to maintain a zone of reduced pressure between the two check valves at all times. The RP also contains tightly closing, resilient seated shut-off valves upstream and downstream of the check valves along with resilient seated test cocks. This assembly is used for the protection of the potable water supply from either pollutants or contaminants and may be used to protect against either backsiphonage or backpressure.

- 12-3.3 Double Check Valve (DC): The Double Check Valve Assembly consists of two internally loaded, independently operating check valves together with tightly closing resilient seated shut-off valves upstream and downstream of the check valves. Additionally, there are resilient seated testcocks for testing of the assembly. The DC may be used to protect against a pollutant only. However, this assembly is suitable for protection against either backsiphonage or backpressure.
- 12-3.4 Double Detector Check Valve (DCDA): The DCDA is composed of a line-sized double check valve assembly with a specific bypass meter and meter-sized double check valve assembly. The meter registers accurately for very low flow rates to detect any unauthorized use of water. This assembly is used when the protection of a double check valve assembly is required, yet where the added requirement of detecting any leakage or unauthorized use of water exists. Normally these assemblies are reserved for use on fire sprinkler lines.
- 12-3.5 Pressure Vacuum Breaker (PVB): The PVB includes a check valve which is designed to close with the aid of a spring when flow stops. It also has an air inlet valve which is designed to open when the internal pressure is one psi above atmospheric pressure so that no non-potable liquid may be siphoned back into the potable water system. Being spring loaded it does not rely upon gravity as does the atmospheric vacuum breaker. This assembly includes resilient seated shut-off valves and testcocks. The PVB must be installed at least twelve 12 inches above all downstream piping and outlets. The PVB may be used to protect against a pollutant or contaminant, however, it may only be used to protect against backsiphonage. It is not acceptable protection against backpressure.
- 12-3.6 Atmospheric Vacuum Breaker (AVB): The AVB is always placed downstream from all shut-off valves. Its air inlet valve closes when the water flows in the normal direction. But, as water ceases to flow the air inlet valve opens, thus interrupting the possible backsiphonage effect. If piping or a hose is attached to this assembly and run to a point of higher elevation, the backpressure will keep the air inlet valve closed because of the pressure created by the elevation of water. Hence, it would not

provide the intended protection. Therefore, this type of assembly must always be installed at least 6 inches above all downstream piping and outlets. Additionally, this assembly may not have shut-off valves or obstructions downstream. A shut-off valve would keep the assembly under pressure and allow the air inlet valve (or float check) to seal against the air inlet port, thus causing the assembly to act as an elbow, not a backflow preventer. The AVB may not be under continuous pressure for this same reason. An AVB must not be used for more than 12 hours out of any 24 hour period. It may be used to protect against either a pollutant or a contaminant, but may only be used to protect against a backsiphonage condition.

## **12-4 REQUIREMENTS**

Section 10-2.607 of the Municipal Code lists requirements indicating locations where the various devices are to be installed.

## **12-5 INSTALLATION**

12-5.1 General: In terms of installation, there is an essential difference between "service" and "internal" protection. Service protection is a backflow device installed outside of the building, but on the customer side of the meter (with the exception of the detector check valve which doesn't have a meter). These devices are specifically intended to protect the City water system regardless of other protective devices inside the building.

Internal protection devices are installed within the building or facility.

12-5.2 Service Protection Devices: The applicant/owner shall submit drawings of the proposed project to the Building Division of the Community Development Department. After reviewing the drawings, the Building Division may require the installation of one or more back-flow prevention devices. The device(s) may be intended for either service or internal protection, or a combination of both. The Public Works Department may also require service protection. If a service protection device is needed, it is usually noted on the Water/Wastewater Permit just prior to the issuance of said permit. In either case, the applicant/owner should make arrangements with the Cross Connection Control Officer for review of the drawings and inspection.

Once installed, the device will be recorded on Public Works Department records and tested as discussed in Section 12-7.

12-5.3 Internal Protection: The installation of these devices falls under the jurisdiction of the Building Division of the Community Development Department. If, upon review by the Public Works Department, the internal devices are deemed to be inadequate for the protection of the public water supply, additional service protection device may be required at or near the point of connection.

## **12-6 APPROVED DEVICES**

A list of all the currently approved backflow prevention devices is available from the Ventura County Environmental Health Division at 800 S. Victoria Avenue, Ventura, California 93009.

Atmospheric type and pressure type vacuum breakers are not approved for protection of the public water supply. Both atmospheric type and pressure type vacuum breakers are intended for internal protection only.

## **12-7 TESTING AND MAINTENANCE**

All backflow prevention devices shall be tested annually by a certified tester with repairs or maintenance as needed. Owners of all devices that have been recorded on Public Works Department records will be notified yearly of this responsibility. A form must be completed by the tester and returned to the Cross Connection Control Officer.