SECTION 600

600. CROSS CONNECTION CONTROL AND BACKFLOW PREVENTION

610. General

This Chapter provides an overview of the City of Hillsboro *Cross Connection Control Program.* The purpose of the Program is to protect public health by maintaining the quality of Hillsboro's drinking water. Rules governing the Program are contained in the Hillsboro Utilities Commission Resolution #222 as codified under Subchapter 2.28, Chapter 2 of the City of Hillsboro *Municipal Code*, and OAR 333-061-0070, OAR 333-061-0071.

The application of the *Cross Connection Control Program* involves the installation of backflow assemblies for *premises isolation*. The Water Department's responsibility for cross connection control is up to the *point of delivery*; therefore, when backflow protection is required by the Water Department, it shall be installed at the *point of delivery* or as directed by the Water Department. Backflow assemblies shall be placed within the property line as close to the water meter as possible, with no connections or tee fittings between the meter and backflow assembly.

Premises isolation backflow protection is specifically for protection of the public water system. It differs in scope from backflow protection required by the *Oregon Plumbing Specialty Code (OPSC*). The protection prescribed in Chapter 6 of the OPSC is primarily for the safety of the water users within a facility. *Premises isolation* backflow protection safeguards the public drinking water supply by effectively isolating it from any contamination originating within the *premises* water distribution system.

620. Installation Requirements:

A plumbing permit is required prior to installing *premises isolation* backflow protection on domestic and irrigation service lines. Backflow protection for fire systems is reviewed and permitted through both the Water Department and the Fire Department Inspector.

Backflow assemblies and devices shall be installed according to the requirements set forth in OAR 333-061-0071, the OPSC and Water Department Standard Drawings (located in the Appendix of this Standard).

The *backflow prevention assembly* for premises isolation is to be located immediately after the water meter on the private property side of the public right-of-way boundary. If installed underground, it shall be placed in a properly sized valve box or vault (see Standard Drawings in the Appendix). Aboveground installations shall be placed in a properly sized enclosure provided with *freeze protection* and according to the Standard Drawings in the Appendix. Fire service connections 3-inch or larger shall have a line size valve installed at the property line of the premises and shall be ductile iron pipe construction to a point which is a minimum of 5-feet beyond the downstream exterior wall of the backflow vault.

The type of *backflow prevention assembly* to be used for *premises isolation* shall be based on the actual or potential hazard within the *premises*. For example: If the *premises* contains fixtures or equipment that require a reduced pressure principle backflow assembly (RP), the City will require a RP immediately after the water meter.

620.1. Typical Conditions Requiring Backflow Protection

An approved, customer owned and maintained *backflow prevention assembly* shall be installed on domestic, irrigation or fire service line(s) to *premises* when any of the following conditions exist:

1. Premises with activities included in Table 43 of OAR 333-061-0070.
2. There is an *auxiliary water supply,* such as a well, *cistern,* or body of water on the property.
3. There is intricate or inaccessible piping, which makes it impractical to ascertain whether or not a *cross-connection* exists.
4. There is an elevation difference between the service connection at the public water main and the highest water outlet on the property that exceeds 30-feet.
5. There is a risk of *backsiphonage* or *backpressure* due to practices or equipment.
6. There is an actual or potential *cross-connection* that presents a health hazard.
7. There is an irrigation system.
8. There is a water storage tank or bulk water filling station for vehicles and/or equipment.
9. There is a temporary water supply provided for construction use.
10. There is a fire line, fire sprinkler system, or private fire hydrant on the premises.
11. There are materials or chemicals on site which present a potential hazard to the water supply.

630. Auxiliary Water Supply:

Water customers having an *auxiliary water supply* such as a well, cistern, or body of water on site are required to have *premises isolation backflow protection.* A Double Check Valve Assembly (DC) is required even if the auxiliary source is used only for irrigation purposes and no connection to the potable line exists. If the *auxiliary water supply* has a chemical injection capability, the protection shall be a Reduced Pressure Backflow Assembly (RP).

Existing connections from a well or other source to the premises water piping system must be fully removed prior to turning on a newly provided service meter to new customers.

If a premises receiving City of Hillsboro water has an abandoned well, a copy of the certificate of abandonment from the appropriate State or County Agency shall be provided to the City of Hillsboro. Once the City of Hillsboro verifies the abandonment, no backflow prevention assembly will be required at the meter unless other hazards warrant it.

640. Approved Backflow Prevention Assemblies and Devices, and Sizes:

A list of *backflow prevention assemblies* approved for use in Oregon is available from the Drinking Water Section of the Oregon Health Authority.

The type of *backflow prevention assembly* required is determined by the hazard level, and the potential for *backsiphonage, backpressure* or both. (See Table 43 in OAR 333-061-0070.)

Assembly size shall be determined by the Building Department or Fire Department Inspector.

640.1. Types of Assemblies and Devices

A. Air Gap (AG):

An Air Gap is the unobstructed vertical distance through free atmosphere between the lowest effective opening from any pipe or faucet conveying water to the receptacle. These vertical, physical separations must be at least twice the effective opening of the water supply outlet, never less than 1-inch above the receiving vessel flood rim.

An approved AG is required on water tank trucks that fill from Bulk Water Hydrants.

Related Standard Drawing: 640-1

B. Double Check Valve Assembly (DC):

A DC is a complete assembly consisting of two internally loaded, independently operating check valves, located between two tightly closing resilient-seated shutoff valves with four properly placed resilient-seated test cocks. This assembly shall only be used to protect against a *non-health hazard* (i.e., a pollutant).

Application examples for DCs:

- Any premises that has an auxiliary water supply such as a private well, cistern, or other body of water.
- Commercial and multi-tenant buildings that do not present a health hazard
- Multi-story buildings in which the highest portion of the water piping is in excess of 30-feet above the water main at the service connection
- Restaurants or other food service establishments (caterers, kitchens, coffee shops, etc.)
- Mobile and manufactured home parks
- Premises with fire service lines, fire sprinkler systems, or private hydrants
- Premises with numerous backflow incidents as evidenced by *Automatic Meter Reading* (*AMR)* reports.

Related Standard Drawings: 640-2B, 640-3 Series, 640-4 Series

C. Double check Detector Assembly (DCDA):

A DCDA is a specially designed backflow assembly consisting of a line-size-approved double check valve assembly with a bypass containing a water meter (Neptune T-10 AMR with E-Coder R900i) and an approved double check valve assembly. The meter shall register accurately for only very low rates of flow up to 3 GPM and shall show a registration for all rates

of flow. This assembly shall only be used to protect against a *non-health hazard* (i.e., pollutant).

Related Standard Drawings: 640-2A, 640-5 Series

D. Reduced Pressure Backflow Assembly (RP):

Also known as a "Reduced Pressure Principle Backflow Assembly," an RP is a complete assembly consisting of a mechanical, independently acting, hydraulically dependent relief valve, located between two independently operating, internally loaded check valves that are located between two tightly closing resilient-seated shutoff valves with four properly placed resilient-seated test cocks. If either check valve leaks, the pressure relief valve maintains a differential pressure of at least 2-psi between the two check valves, by discharging water to the atmosphere. The reduced pressure backflow assembly is designed to prevent backflow caused by backpressure and backsiphonage from low to high *health hazards*.

Application examples for the RP:

- Commercial, industrial and multi-tenant buildings that present a health hazard
- Food processing and beverage bottling including ice manufacturing plants and bottled water industries.
- Chemical plants, manufacturing plants, metal plating industries
- Industries that use heat exchangers
- Spas and pedicure salons
- Premises with boilers
- Hospitals, medical offices, dental clinics, veterinary offices, plasma centers, convalescent facilities, and other health care facilities
- Laboratories (chemical, medical, biological, environmental testing, etc.)
- Mortuaries
- Fueling (gas) stations
- Automotive service facilities
- Sewage treatment plants and sewage pump stations
- Dry cleaners and commercial laundries
- Car wash facilities
- Any water system with pumps to supplement pressure
- Premises with chemically treated fire sprinkler systems.
- Irrigation systems that contain injectors for the addition of chemicals or fertilizer

- Irrigation systems that use pumps
- Water tanker trucks or other water storage systems without a permanent air gap assembly.
- Farms, including hobby farms that use water for other than household purposes.
- Premises where both reclaimed and potable water are used
- Premises with piping under pressure for conveying liquids other than potable water and the piping is installed in proximity to potable water piping
- Premises where City staff is denied access or restricted access for survey
- Any premises or other water using activity that presents a health hazard to the public water supply.

Related Standard Drawings: 640-6, 640-7, 640-8, 640-9, 640-10

E. Reduced Pressure Detector Assembly (RPDA):

Also known as a "Reduced Pressure Principle Detector Assembly," an RPDA is a specially designed backflow assembly consisting of a line-size approved reduced-pressure principle backflow prevention assembly with a bypass containing a water meter (Neptune T-10 AMR with E-Coder)R900i) and an approved reduced-pressure principle backflow prevention assembly. This assembly shall be used to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant). The RPDA is primarily used on fire sprinkler systems.

An RPDA will be required on the fire service line of premises that use foamite, antifreeze, or other chemicals within their fire protection system. Also, if the fire protection system has an unapproved auxiliary water supply that is connected or intended to be connected to the fire system an RPDA will be required by the Water Department.

Related Standard Drawings: 640-6, 640-7, 640-8, 640-9, 640-10

F. Pressure Vacuum Breaker Assembly (PVB) for Irrigation:

A PVB is a backflow assembly consisting of an independently operating, loaded air-inlet valve located on the discharge side of the check valve, with properly located resilient-seated test cocks and tightly closing resilient-seated shutoff valves attached at each end of the assembly designed to be operated under pressure for prolonged periods of time to prevent backsiphonage. The pressure vacuum breaker may not be subjected to any backpressure.

PVB's are to be used only when the danger of backflow is from backsiphonage. An advantage of this assembly is that only one PVB is required per irrigation system. The system cannot have pumps or possibility of backpressure after the PVB. Control valves for the irrigation system must be installed on the downstream side or after the PVB. The PVB must be installed a minimum of 12-inches above the highest point of the irrigation system that it serves and must not be placed in an area subject to flooding. Per the Oregon Plumbing Specialty Code (OPSC), the PVB is approved for high hazards.

Related Standard Drawing: 640-2B

G. Atmospheric Vacuum Breaker (AVB) for Irrigation:

An AVB consists of a float check, a check seat, and an air-inlet port. A shutoff valve immediately upstream may or may not be an integral part of the device. The AVB is designed to allow air to enter the downstream water line to prevent backsiphonage. This unit may never be subjected to a backpressure condition or have a downstream shutoff valve or be installed where it will be in continuous operation for more than twelve (12) hours AVBs are approved by the OPSC for high hazards when only subjected to backsiphonage conditions.

If used on an irrigation system, one AVB is required for each irrigation zone. Chemicals or fertilizer may not be introduced into the irrigation system that contains AVB's. The AVB shall not be installed in a corrosive or dusty environment, or in areas that are subject to flooding. The AVB must be installed at least 6-inches above the highest point of the downstream piping or outlets. It must be used intermittently and shall not be pressurized for more than twelve (12) hours during a 24-hour period.

Related Standard Drawing: 640-2B

650. Testing of Backflow Prevention Assemblies:

State of Oregon Administrative Rules requires *backflow prevention assemblies* to be tested at the time of installation, when repaired or moved, and at least annually thereafter. All testing must be performed by a State-certified Backflow Tester. Test reports for DCDA's and RPDA's must include the detector meter reading. Results of the test must be provided to the Water Department within ten (10) working days* of the test.

*The 10-day requirement is based on the State of Oregon Rules and not on financial conditions or payment arrangements between the Tester and the customer.