

# Technical Solution Sheet 8.02

## 8: Backflow Prevention (Medium & high risk only)

### Cross Connections in Drinking Water Supplies

#### AIM

The aim of this technical solution is to clarify some of the plumbing issues associated with cross connections in drinking water supplies.

#### PLUMBING REGULATIONS 2008

The *Plumbing Code of Australia* (PCA) is adopted by and forms part of the *Plumbing Regulations 2008*. Part B of the PCA specifies the objectives and performance requirements related to the installation of water services. *AS/NZS 3500.1: Plumbing and drainage Part 1: Water Services* and *AS/NZS 3500.4: Plumbing and drainage Part 4: Heated water services* are “deemed to satisfy” documents listed in Part B of the PCA with both standards containing sections on Cross connection control and backflow prevention.

#### CROSS CONNECTIONS AND BACKFLOW – WHAT ARE THEY?

A cross connection is any connection between a drinking water supply system and any non-drinking supply or any other substance which could under any conditions result in contamination of the drinking water supply system.

Backflow, which is the unwanted reversal of flow into the drinking water supply, will occur under conditions of back pressure or back siphonage. Backflow can be prevented by installing Mechanical Backflow Devices, (see Figures 1 and 2).

#### SOLUTIONS TO CROSS CONNECTIONS AND BACKFLOW

Solutions to cross connections and backflow can be found in Section 4 of *AS/NZS 3500.1*. Examples of potential cross connections can be found in Appendix E and types of backflow protection suitable for various cross connections are in Appendix F.

#### PROVIDING PROTECTION

Where protection is provided at the cross connection, this is known as Individual Protection. Where protection is provided for a selected area of a property or section of pipework, this is known as Zone Protection.

Where protection is provided at the property boundary at the outlet of the main water meter, this is known as Containment Protection. The requirements for containment protection are specified by the relevant Water Authority to prevent backflow and contamination of the authority’s water main.

Water downstream (outlet side) of any device fitted for Individual or Zone Protection is classified as non-drinking whereas water downstream of a device fitted for Containment Protection is classified as drinking unless there are unprotected hazards within the property.

#### HAZARD RATING & DEVICE TYPE

Cross connections are rated into three degrees of hazard; High, Medium and Low. High hazards are associated with connections of a toxic or

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bacterial nature that have the potential to cause death. Medium hazards have the potential to endanger health, whereas a low hazard would constitute a nuisance but not endanger health. Backflow prevention devices are classified as either testable or non-testable.

A testable backflow device must be installed with cross connections of a medium or high hazard rating and should only be installed with an Annual Maintenance and Test Program. These devices can be tested in-situ.

## OWNER'S RESPONSIBILITY

It is the property owner's responsibility to ensure that any testable device is inspected and tested at least annually.

**FIGURE 1 - RANGE OF TYPICAL BACKFLOW PREVENTION DEVICES**



**FIGURE 2 - TYPICAL FIRE AND GENERAL SERVICE**



## CONTAINMENT PROTECTION

When selecting a device suitable for retrofit (existing property) containment protection, all cross connections and hazards within the property must first be identified. Where any cross connection is identified, appropriate backflow protection must be provided, or such cross connection should be reported to the owner and relevant water authority. Before selecting a backflow device appropriate to the hazard rating, all options to remove the cross connection must be considered. If acceptable, it is preferable to remove the cross connection.

Appendices E and F are provided for information and guidance and do not form an integral part of *AS/NZS 3500.1*. The appendices should be used as a guide in assessing the hazard/device selection, however, given there are only three hazard levels, the situation is often over prescribed where a testable high and medium hazard device is prescribed rather than a non testable low hazard device.

The pressure and water flow through devices will vary between various device types, device sizes and manufacturers. It is generally true for mechanical backflow devices that backflow devices for high hazards will result in a higher pressure loss than backflow devices for low hazards. Therefore, an over prescribed valve can cause an unacceptable pressure and water flow loss, especially in fire service installations.

## INSTALLATION / COMMISSIONING

Plumbers with a water supply licence and or registration can install the device. Installations must comply with Section 4 of *AS/NZS 3500.1* and *AS/NZS 3500.4*. For Containment protection at main meter assemblies, the Victorian Building Authority has published Technical Solution Drawings of Typical Water and Fire Services. [www.vba.vic.gov.au](http://www.vba.vic.gov.au)

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A compliance certificate is required if the value of any installation is \$750 or greater. Where the hazard rating in any cold or hot water installation is Medium or High Risk, the licensed plumber must circle Work Code 8 on the compliance certificate and provide the installation details in the space provided on the certificate.

Commissioning, maintenance, testing and annual retesting of any testable backflow device installed in a medium or high hazard situation, can only be performed by a person who is licensed in the Specialised Class of Plumbing “Backflow Prevention Work” or a person who is registered in the Specialised Class of Plumbing “Backflow Prevention work” under the supervision of a person who is licensed to carryout work of that class.

It is this person’s responsibility prior to commissioning to ensure that the backflow device fitted is appropriate to the hazard rating.

**FIGURE 3 - REDUCED PRESSURE ZONE DEVICE - RETROFITED FOR CONTAINMENT PROTECTION**

