

# Developing New Zealand's Building Code

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To support Plumbing and Drainlaying work across NZ



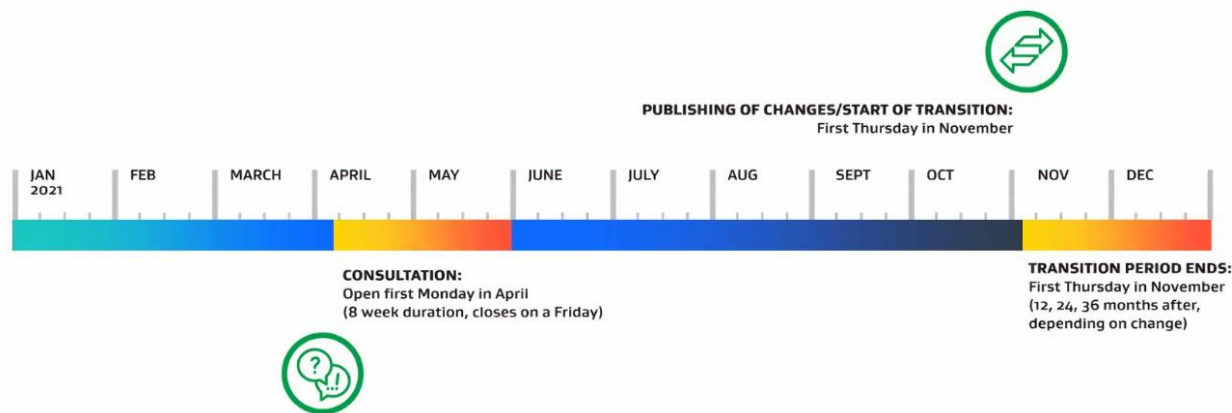


- MBIE and Building Performance
- Building Act 2004 and Building Code
- Demarcation of responsibility
- Proposals for change



## What we're doing

### Key dates





- IQPs and Specified Systems
- All building work must comply with building code
- Building owners responsibilities
- Building consents
- Requirement for compliance schedules
- Annual building warrant of fitness

# The Building Code



**A**  
BUILDING CODE  
General provisions



**B**  
BUILDING CODE  
Stability



**C**  
BUILDING CODE  
Protection from fire



**D**  
BUILDING CODE  
Access



**E**  
BUILDING CODE  
Moisture



**F**  
BUILDING CODE  
Safety of users



**G**  
BUILDING CODE  
Services and facilities



**H**  
BUILDING CODE  
Energy efficiency



**E1 SURFACE WATER** Disposal of rainwater from external surfaces and confirmation surface water cannot enter the building.



**G1 PERSONAL HYGIENE** Providing sufficient sanitary fixtures (toilets, showers and basins) for sanitation.



**G10 PIPED SERVICES** Requires the safe distribution of hot, cold or toxic substances.



**G11 GAS AS AN ENERGY SOURCE** Requires the safe installation of gas-fuelled appliances.



**G12 WATER SUPPLIES** Requires the safe supply, storage, reticulation and delivery of hot and cold water.



**G13 FOUL WATER** Requires the safe disposal of foul water to prevent illness and the loss of amenity due to odour and accumulated matter.



**G14 INDUSTRIAL LIQUID WASTE** Requires the safe and hygienic collection, treatment and disposal of industrial liquid waste to avoid contamination.



**B1 STRUCTURE** Buildings will withstand likely loads, including wind, earthquake, live and dead loads (people and building contents).



**B2 DURABILITY** Confirming the use of materials that will remain functional for the minimum periods specified (5, 15 or ≥50 years).



**C3 FIRE AFFECTING AREAS BEYOND THE SOURCE** Fire affecting areas beyond the source: vertical or horizontal fire spread, Material Group Numbers, surface



**C2 PREVENTION OF FIRE OCCURRING** Safe design and installation of fixed appliances using controlled combustion and other fixed equipment.



**E2 EXTERNAL MOISTURE** External roof, wall claddings and external openings will prevent external moisture from causing undue dampness or damage.



**E3 INTERNAL MOISTURE** Surfaces in wet areas must be impervious, easily cleaned, and have ventilation to meet conditions for health and safety.



**G2 LAUNDERING** Providing sufficient laundry facilities.



**G4 VENTILATION** Requires ventilation to all occupied spaces.



**G5 INTERIOR ENVIRONMENT** Habitable spaces with sufficient space for activity, accessible facilities and controlled internal temperature.



**G6 AIRBORNE AND IMPACT SOUND** Prevention of undue noise transmission in building elements between occupancies or common spaces in household units.



**H1 ENERGY EFFICIENCY** Provides for the efficient use of energy and sets physical conditions for energy performance.



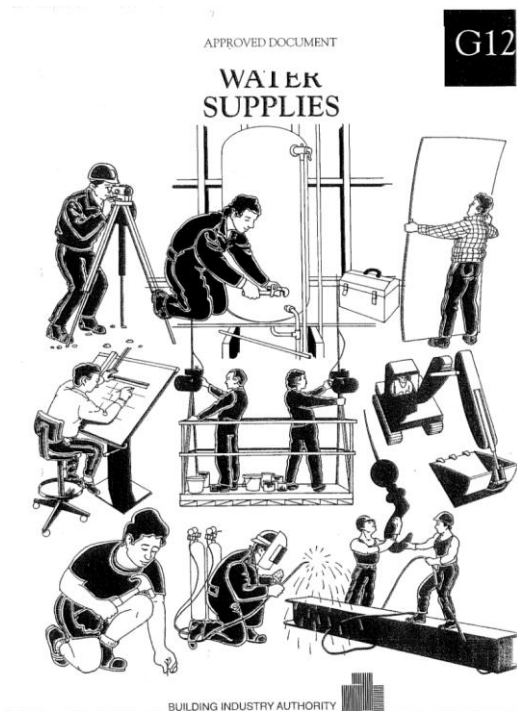


A key objective of clause G12 is to safeguard people from illness caused by contaminated water.

**Clause G12 requires that:**

- A potable *water supply system* must be—
  - (a) protected from contamination; and
  - (b) installed in a manner that avoids the likelihood of contamination within the system and the *water main*; and
  - (c) installed using components that will not contaminate the water.

# NZBC Clause G12 Water Supplies



MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT  
HĀKINA WHAKATUTUKI

## Acceptable Solutions and Verification Methods

For New Zealand Building Code Clause  
**G12 Water Supplies**



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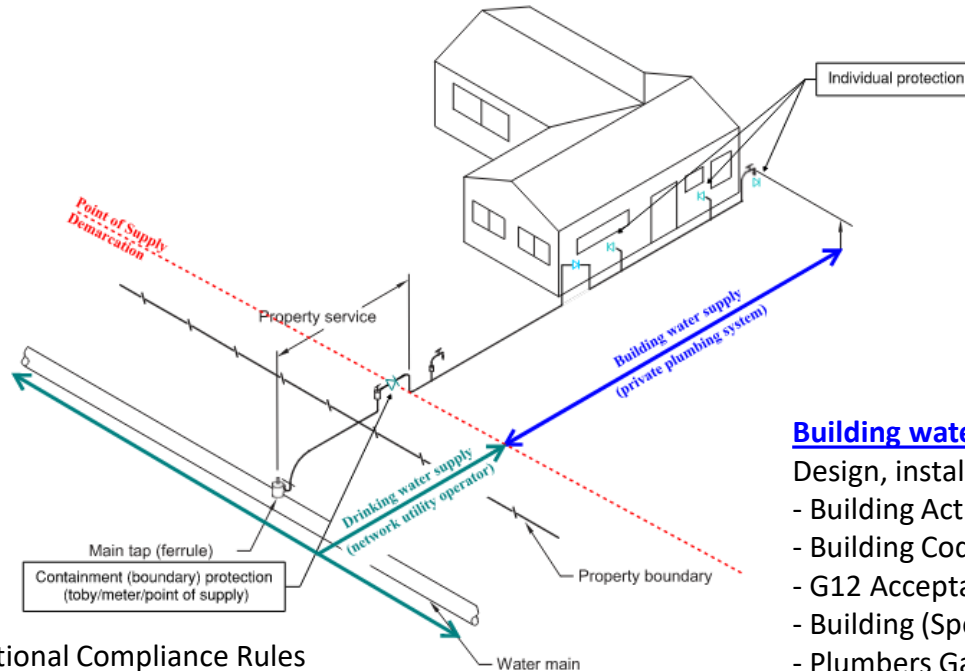


## Acceptable Solution G12/AS1

### **3.0 Protection of Potable Water**

- 3.1 Drawn water not to be returned
- 3.2 Cross connections prohibited
- 3.3 Cross connection hazard
- 3.4 Backflow protection
- 3.5 Air gap
- 3.6 Backflow prevention devices
- 3.7 Testing

# Demarcations



## Drinking water supply

Soon to be regulated by:

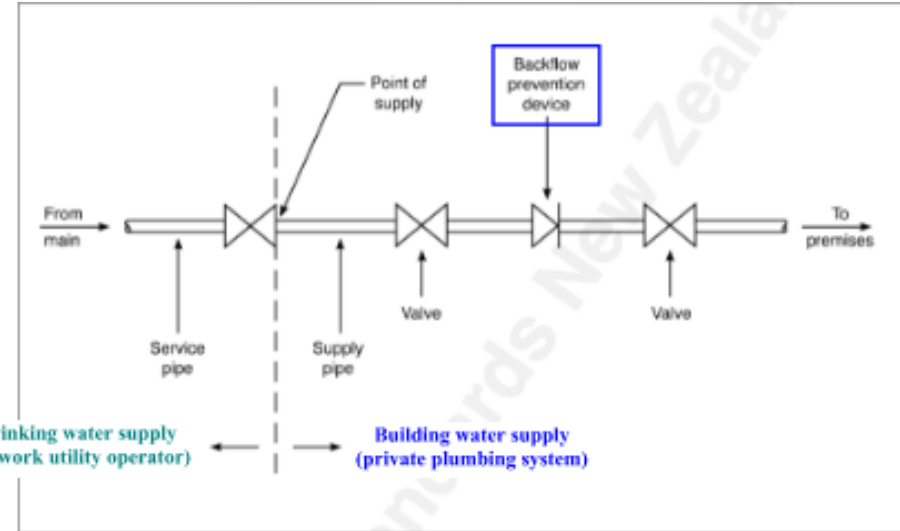
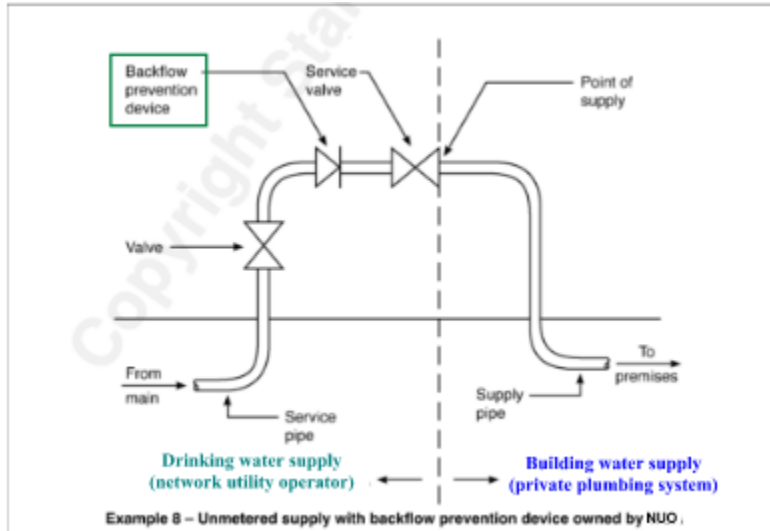
- Water Services Act 202x
- Drinking Water Supply Operational Compliance Rules

## Building water supply

Design, installation & ongoing testing regulated by:

- Building Act 2004
- Building Code Clause G12 Water Supplies
- G12 Acceptable Solutions & Verification Methods
- Building (Specified Systems...) Regulations 2005
- Plumbers Gasfitters and Drainlayers Act 2006

# Demarcations



# 2022 NZBC Plumbing Update



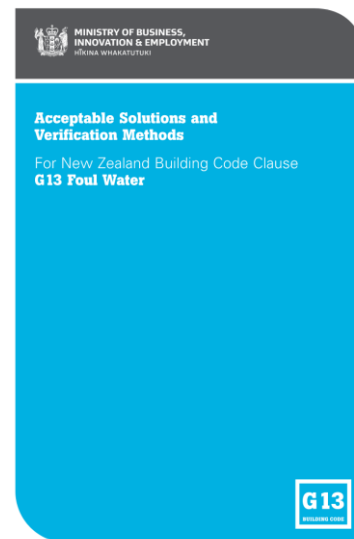
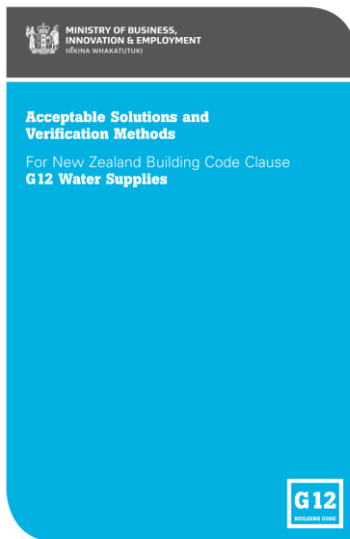
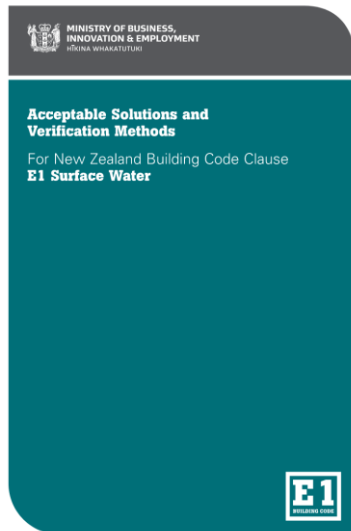
**SURFACE WATER** Disposal of rainwater from external surfaces and confirmation surface water cannot enter the building.



**WATER SUPPLIES** Requires the safe supply, storage, reticulation and delivery of hot and cold water.



**FOUL WATER** Requires the safe disposal of foul water to prevent illness and the loss of amenity due to odour and accumulated matter.

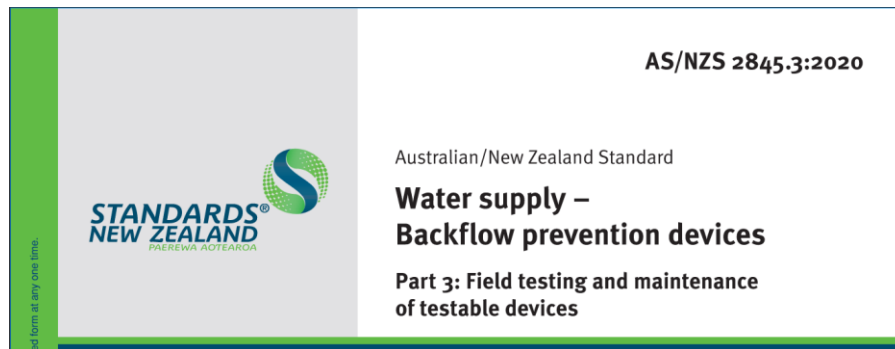




## AS/NZS 2845: Water supply – Backflow prevention devices

Part 1: 202x ~~2010~~ Materials, design and performance requirements

Part 3: 2020 ~~1993~~ Field testing and maintenance of testable devices



# AS/NZS 3500:2021 Standards





## **AS/NZS 3500.1:2021 Water services**

Section 1 Scope and general

Section 2 Materials and products

Section 3 Sizing of water services

Section 4 Cross-connection control and backflow prevention

Section 5 Installation of cold water services

Section 6 Fire services

Section 7 Irrigation and lawn watering systems

Section 8 Water storage tanks

Section 9 Non-drinking water services

Section 10 Treated greywater services

Section 11 Water for sanitary flushing

~~Installation of water supply to specified fixtures~~

Section 12 Pumps

Section 13 Water requirements for hemodialysis machines

Section 14 Property water meters

Section 15 Installation of water supply systems from rainwater tanks

Section 16 Multi-unit developments

Section 17 Testing and commissioning

## **Appendices**

A Equivalent pipe sizes

B Demonstrating products and materials are fit for purpose

~~Acceptable pipes and fittings~~

C Sizing method for supply piping for dwellings

D Sizing of piping for dwellings

E Examples of potential cross-connections

~~Types of backflow protection~~

F Storage tanks-Inflow and overflow

G Cleaning and disinfection of storage tanks

H Disinfection of water services



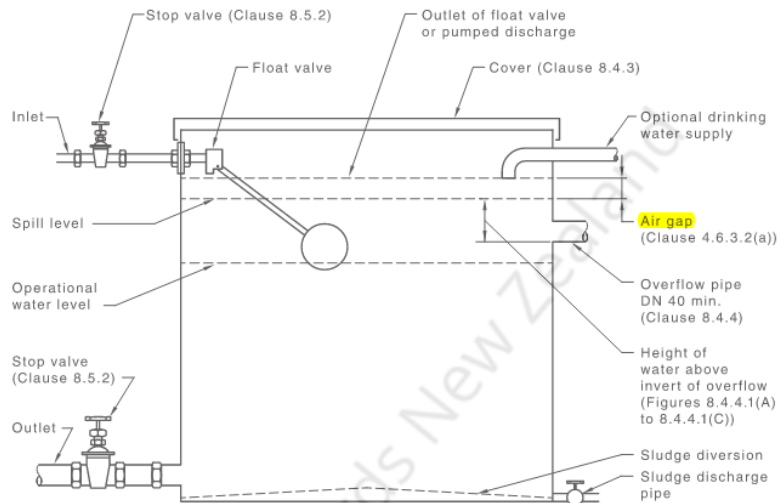


Figure 8.4.1 — Cold water storage tank

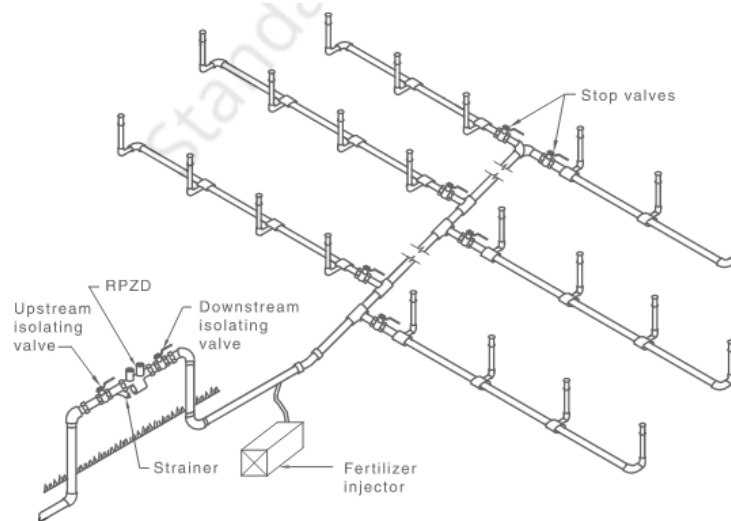
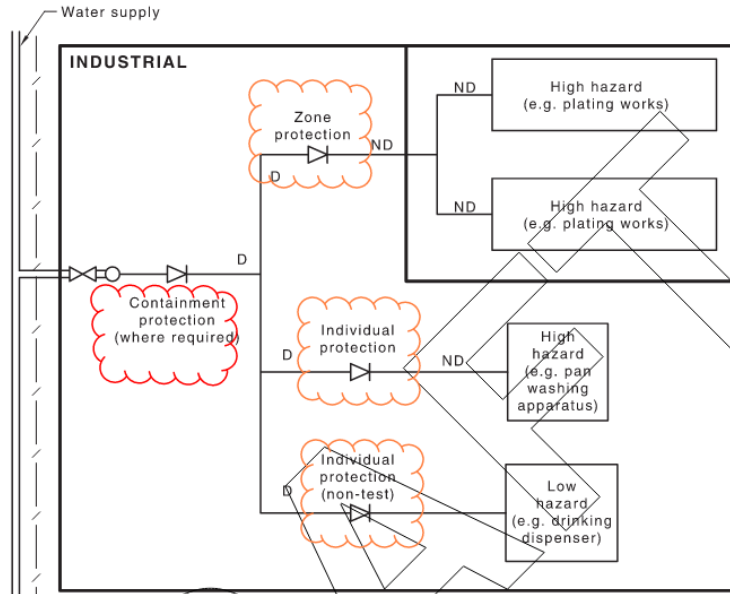


Figure 7.2(F) — Type D system — Testable devices subject to back-pressure or no back-pressure for applications with chemical additives — Reduced pressure zone device

## AS/NZS 3500.1:2021

## G12/AS1



### 3.6 Backflow prevention devices

#### 3.6.1 Location

*Backflow prevention devices and air gaps shall be located:*

- As near as practicable to the potential source of contamination, and

## AS/NZS 3500.1:2021

Table 4.4.1 — Suitability of devices

Registered or testable backflow prevention device	Cross-connection hazard rating	Protection against back-pressure	Protection against back-siphonage
<b>(a) Registered testable devices</b>			
Registered break tank (RBT)	High/medium/low	Yes	Yes
Registered air gap (RAG)	High/medium/low	Yes	Yes
Reduced pressure zone device (RPZD) <sup>a</sup>	High/medium/low	Yes	Yes
Reduced pressure detector assembly (RPDA) <sup>a</sup>	High/medium/low	Yes	Yes
Double-check valve assembly (DCV) <sup>a</sup>	Medium/low	Yes	Yes
Double-check detector assembly (DCDA) <sup>a</sup>	Medium/low	Yes	Yes
Spill resistant pressure type vacuum breaker (SPVB) <sup>a</sup>	High/medium/low	No	Yes
Pressure type vacuum breaker (PVB) <sup>a</sup>	High/medium/low	No	Yes
<b>(b) Non-testable devices</b>			
Dual-check valve with atmospheric port (DCAP) <sup>b</sup>	Low	Yes	Yes
Dual-check valve (DUAL CV) <sup>b</sup>	Low	Yes	Yes
Dual-check valve with intermediate vent (DuCV) <sup>b</sup>	Low	Yes	Yes
Air gap (AG)	High/medium/low	No	Yes
Break tank (BT)	Low	No	Yes
Atmospheric vacuum breaker (AVB) <sup>b</sup>	High/medium/low	No	Yes
Hose connection vacuum breaker (HCVB) <sup>b,c</sup>	Low	No	Yes
Beverage dispenser dual-check valve (BDDC) <sup>b</sup>	Low	Yes	Yes
Pipe interrupter device (PID)	Low	No	Yes
<b>(c) Fire services in Australia only</b>			
Single check valve (testable) (SCVT) <sup>a</sup>	Low	Yes	Yes
Single check detector assembly (testable) (SCDAT) <sup>a</sup>	Low	Yes	Yes

## G12/AS1

**Table 2:** Selection of Backflow Protection  
Paragraph 3.4.5

Type of backflow protection	CROSS CONNECTION HAZARD					
	HIGH		MEDIUM		LOW	
	back-pressure	back-siphonage	back-pressure	back-siphonage	back-pressure	back-siphonage
Air gap (see <b>Note 1</b> )	✓	✓	✓	✓	✓	✓
Reduced pressure zone device	✓	✓	✓	✓	✓	✓
Double check valve assembly (see <b>Note 2</b> )			✓	✓	✓	✓
Pressure type vacuum breaker (see <b>Note 3</b> )		✓		✓		✓
Atmospheric vacuum breaker (see <b>Note 4</b> )		✓		✓		✓

**Note:**

1. Air gaps must not be installed in a toxic environment.
2. Double check valves can be installed in a medium and low hazard toxic environment.
3. Pressure type vacuum breakers are designed to vent at 7 kPa or less. However, they require a significantly higher pressure to reset and must be installed only in systems which provide pressures sufficient to ensure full closing of the valve.
4. Hose outlet vacuum breakers are a specific type of atmospheric vacuum breaker.



## 3.3 Cross Connection Hazard

### 3.3.1 High hazard

Any condition, device or practice which, in connection with the *potable water supply system*, has the potential to cause death.

**COMMENT:**

High hazard may include but not necessarily be limited to:

- a) Autoclaves and sterilisers
- b) Systems containing chemicals such as anti-freeze, anti-corrosion, biocides, or fungicides
- c) Beauty salon and hairdresser's sinks
- d) Boiler, chiller and cooling tower make-up water
- e) Car and factory washing facilities
- f) Chemical dispensers
- g) Chemical injectors
- h) Chlorinators
- i) Dental equipment
- j) Direct heat exchangers
- k) Fire sprinkler systems and fire hydrant systems that use toxic or hazardous water

- l) Hose taps associated with High hazard situations like mixing of pesticides
- m) Irrigation systems with chemicals
- n) Laboratories
- o) Mortuaries
- p) Pest control equipment
- q) Photography and X-ray machines
- r) Piers and docks
- s) Sewage pumps and sump ejectors
- t) Sluice sinks and bed pan washers
- u) Livestock water supply with added chemicals
- v) Veterinary equipment

**Note:** The examples given are not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

- w) Bidets and douche seats
- x) Handheld bidet hoses and WC trigger sprays

### 3.3.2 Medium hazard

Any condition, device or practice which, in connection with the *potable water supply system*, has the potential to injure or endanger health.

**COMMENT:**

Medium hazard may include but not necessarily be limited to:

- a) Appliances, vehicles or equipment
- b) Auxiliary water supplies such as pumped and non-pumped fire sprinkler secondary water
- c) Deionised water, reverse osmosis units and equipment cooling without chemicals
- d) Fire sprinkler systems and building hydrant systems
- e) Hose taps and fire hose reels associated with Medium hazard
- f) Irrigation systems with underground controllers
- g) Irrigation without chemicals
- h) Livestock water supply without added chemicals
- i) Untreated water storage tanks
- j) Water and steam cleaning
- k) Water for equipment cooling
- l) Drink dispensers with carbonators
- m) Swimming pools, spas and fountains

**Note:** The examples given are not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

Treated grey water

### 3.3.3 Low hazard

Any condition, device or practice which, in connection with the *potable water supply system*, would constitute a nuisance, by colour, odour or taste, but not injure or endanger health.

**COMMENT:**

Low hazard may include but not necessarily be limited to:

- a) Drink dispensers (except carbonators).

**Note:** The example given is not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.

- a) Drink dispensers (see Note 2) (except carbonators)
- b) Drinking fountains and bottle fillers
- c) Rainwater tanks and supply systems (see Note 3)
- d) External hose taps, with no hazards within 18m
- e) Emergency eye wash and shower stations

**Note:**

1. The examples given are not an exhaustive list. Where there is doubt comparison must be made to the hazard definitions.
2. For carbonated drink dispensers, the pipework material installed downstream of the backflow prevention device shall not be affected by carbon dioxide gas.
3. Air gap separation is the recommended type of backflow prevention for a rainwater tank with a potable water supply connection.



**3.4.3** Backflow protection shall be achieved by:

- a) An *air gap*, in accordance with Paragraph 3.5, or
- b) A *backflow prevention device* selected in accordance with Paragraphs 3.4.4 and 3.4.5.

**3.4.4** Backflow protection shall be appropriate to the *cross connection* hazard contained in Paragraph 3.3.

**3.4.5** The selection of the appropriate *backflow* protection for the *cross connection* hazard is given in Table 2.

**COMMENT:**

Table 2 includes *air gap* separation.

...3.4.5, or

c) A *backflow prevention device* provided as an integral part of a fixture, appliance or apparatus that is appropriate for the cross-connection hazard.

3.4.X Where a site listed in Table X is connected to a *network utility operators water main*, containment\* backflow protection shall be provided.

**COMMENT**

Containment backflow protection is achieved by providing an air gap or backflow protection device at the property boundary to protect the *network utility operators water main* from any contamination risk posed by a site. Water downstream of a containment device is considered to be potable unless there are unprotected hazards within the premises.

# G12/AS1 s3 Containment Protection



**Table X:** Containment Protection – Hazard ratings and backflow prevention devices  
Paragraph 3.4 X

Form of cross connection	Hazard Rating	Backflow prevention device
Abattoirs	High	Air Gap or RPZD
Car and plant washing facilities	High	Air Gap or RPZD
Chemical laboratories	High	Air Gap or RPZD
Chemical plants	High	Air Gap or RPZD
Factories using, processing or manufacturing toxic chemicals	High	Air Gap or RPZD
Hospitals, mortuaries, clinics and the like	High	Air Gap or RPZD
Metal finishing plants	High	Air Gap or RPZD
Pathology laboratories	High	Air Gap or RPZD
Petroleum processing plants or storage plants	High	Air Gap or RPZD
Piers, docks and other waterfront facilities	High	Air Gap or RPZD
Premises where access to conduct inspections is restricted	High	Air Gap or RPZD
Premises with an alternative water supply, excluding rainwater harvesting tanks	High	Air Gap or RPZD
Sanitary depots	High	Air Gap or RPZD
Sewage treatment plants and sewage lift stations	High	Air Gap or RPZD
Universities	High	Air Gap or RPZD

Form of cross connection	Hazard Rating	Backflow prevention device
Caravan parks	Medium	Air Gap or Testable Device
Food and beverage processing plants	Medium	Air Gap or Testable Device
Marinas	Medium	Air Gap or Testable Device
Premises with fire-fighting water services	Medium	Air Gap or Testable Device
Premises with greywater re-use systems	Medium	Air Gap or Testable Device
Premises with reticulated and disinfected reclaimed water systems	Medium	Air Gap or Testable Device
Public swimming pools	Medium	Testable Device
Premises with rainwater tanks	Low	Air gap or Non-testable Device





- b) In an accessible position for maintenance and testing to AS 2845.3 or NZ backflow testing standard.

**COMMENT**

1. An accessible position excludes those which necessitate the need to maintain or test a device from a ladder or scaffolding.
2. Where a device is fitted with test taps, an accessible position includes sufficient clearance for the performance of the applicable test procedures.



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