

Recycled Water (Non-Drinking Water Supply)

AIM

The aim of this Technical Solution is to clarify some of the plumbing issues associated with the installation of recycled or reclaimed water services that are classified as “non-drinking water services”.

PLUMBING REGULATIONS 2008

The *Plumbing Code of Australia* (PCA) is adopted by and forms part of the *Plumbing Regulations 2008*. Part B3 of the PCA specifies the objectives and performance requirements related to the installation of non-drinking water services. *AS/NZS 3500.1 Plumbing and drainage - Part 1: Water Services* and Section 2 of *AS/NZS 3500.5 Plumbing and drainage - Part 5: Housing installations* are “Deemed to Satisfy” documents listed in Part B3 of the PCA and both contain sections on non-drinking water services.

DESCRIPTION OF THE CLASSES OF RECYCLED WATER

There are four classes of recycled water: A, B, C & D. The main difference between the classes is the measure of E.coli in the water. E.coli is bacteria found in the intestines of warm blooded animals that indicates faecal contamination.

The four classes of recycled water represent four minimum standards of biological treatment and pathogen reduction. Table 1 provides a guide to the classes including appropriate uses for each class of recycled water.

Recycled water is available in numerous housing developments to provide for toilet flushing, irrigation, external cleaning, car washing and clothes washing machine use. The recycled water is generally treated to Class A standard, and reticulated to individual properties by a water authority or provider (see Table 1).

This creates what is commonly referred to as a “Dual Pipe System”. A recycled water supply can also be from a privately owned and maintained treatment plant.

Examples of applications for privately owned treatment plants may include:

- owner’s corporation multi-unit developments
- owner’s corporation high rise apartment buildings
- industrial process water reclamation
- agricultural processes
- stormwater capture and re-use.

MAINS

The recycled water main is purple coloured, generally of plastics material but may be of other materials such as ductile iron wrapped in a purple sleeve (see Figure 1).

METERS

- Meters are to be purple in colour.
- Meters have different inlet and outlet couplings to prevent interchange.
- Purple sleeved copper or other approved non-plastics material is required for the meter up-stands (see Figure 3).

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APPROVED MATERIALS (PIPES ETC.)

- Recycled water piping must be coloured purple or, where not integrally coloured purple, identified by means of close fitting durable purple coloured sleeving, netting or spirally wrapped tape (see Figure 4).
- Copper pipe must be purple sheathed.
- All products and materials must be certified under the WaterMark certification scheme where required under the PCA.

INSTALLATION

- All buried recycled water pipe must have identification tape fastened on top of the pipe at intervals not greater than 3m.
- 300mm minimum separation must be maintained between drinking water and recycled water services below ground.
- 100mm minimum separation must be maintained between drinking water and recycled water services above ground.

TESTING AND COMMISSIONING

At the completion of any work on water services at sites where a recycled water supply is also present or at the completion of any work on a recycled water supply, the services must be flushed and hydrostatically tested.

Work must also be tested for any cross-connection prior to commissioning as recommended in the following procedure:

- 1 Turn off the drinking water supply at the water meter and turn on the recycled water service.
- 2 Turn on all drinking water taps both hot and cold one by one. All drinking water taps and any drinking water points to appliances should run dry after a short period of time.
- 3 After all taps have run dry, flush all toilets. The toilets should refill as normal provided they are connected to the recycled water supply.

- 4 Turn on all outside taps, external drinking water taps should run dry. Any tap that continues to run is connected to the recycled water service and must be clearly identified with warning signs
- 5 Turn on any additional recycled water service points (e.g. a recycled water point to a clothes washing machine). Check to see the water is running and that the recycled water point is also clearly identified.
- 6 Provided the above steps are satisfactorily completed, turn on both the drinking water and recycled water service meters.
- 7 Turn on the drinking water and recycled water taps located furthest from the meters so that any trapped air is purged from the pipelines as they are recharged.

EXTERNAL RECYCLED WATER TAPS

External recycled water taps must:

- have a non-standard inlet thread.
- be purple in colour.
- have a removable handle.
- **be clearly marked with either a prohibition sign or warning sign (see Figure 5).**

BACKFLOW PREVENTION (FOR PROPERTIES WITH CLASS A RECYCLED WATER)

As recycled water and drinking water are delivered to properties through a dual pipe arrangement, it is essential that adequate backflow prevention measures are in place.

The authority supplying the drinking water will require a backflow prevention device on the drinking water meter suitable for the degree of hazard.

All external drinking water taps must be fitted with a hose connection vacuum breaker. It is the responsibility of the installing plumbing practitioner to ensure that no cross-connection with the drinking water has occurred and that this is tested for at the commissioning stage.

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TABLE 1 - CLASSES AND APPROPRIATE USES OF RECYCLED WATER

Class	E.coli measure	Appropriate uses
A	<10 E.coli org/100ml	Residential garden watering, toilet flushing, clothes washing, food crop irrigation, parks, gardens & sports ground irrigation, Industrial processes
B	<100 E.coli org/100ml	Urban uses with restricted public access, livestock drinking water, closed industrial systems, irrigation of dairy cattle grazing fodder
C	<1000 E.coli org/100ml	Urban uses with restricted public access, cooked / processed human food crops, some crops not exposed directly to water (e.g. apples)
D	<10000 E.coli org/100ml	Non-food crops, e.g. woodlots, turf, flowers

In cases of privately owned and maintained recycled water treatment systems, individual and zone backflow prevention protection must be assessed and provided in accordance with Section 4 Cross-Connection Control and Backflow Prevention of [AS/NZS 3500.1](#) and/or Section 2 of [AS/NZS 3500.5](#).

The requirements for containment protection at the outlet of the main drinking water meter vary depending on the relevant water authority. However, the containment protection hazard rating is generally considered “high” requiring a testable device such as a RBT (registered break tank) or RPZD (reduced pressure zone device).

SOME ISSUES RELATED TO RECYCLED WATER USE:

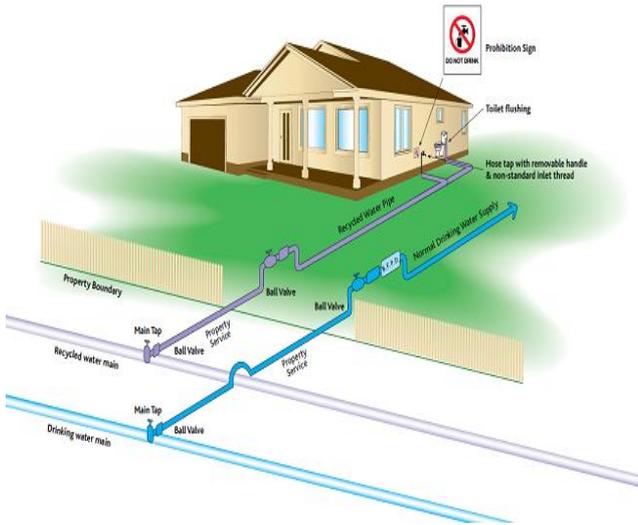
- Recycled water services are to be installed in accordance with the requirements for drinking water.
- Recycled water should be confined within the property boundary.
- Recycled water should not leak or be discharged into the stormwater system.
- Don’t use recycled water for cooking.
- Different detergents produce different results when washing clothes with recycled water, choose the detergent that works best for you when using recycled water in a clothes washing machine.
- Don’t use recycled water for evaporative cooling units.
- Don’t use recycled water to fill swimming pools, spas or children’s water toys.
- Don’t shower or bathe with recycled water.

FIGURE 1 - RECYCLED WATER MAIN AND PROPERTY SERVICE



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FIGURE 2 - DUAL PIPE SYSTEM



Note:

The relevant water authority's conditions of connection must be adhered to and may require the recycled water service to be to the left of the drinking water service at the meter assembly.

BACKFLOW PREVENTION

Recycled water services must not have any form of cross-connection with the drinking water supply. Where a property is served by a recycled water supply a backflow device suitable for the degree of hazard would be required at the water meter or, where no water meter is fitted, at the property boundary.

FIGURE 3 - RECYCLED AND DRINKING WATER METER ASSEMBLIES



FIGURE 4 - EXAMPLES OF APPROVED MATERIALS



FIGURE 5 - EXTERNAL HOSE BIBS WITH PROHIBITION SIGNS AND REMOVABLE HANDLE

