

Guidelines for **rainwater tanks** on residential properties



Plumbing requirements

Information for rainwater tank suppliers
and plumbers

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Plumbing for rainwater tanks

A guide for rainwater tank suppliers and plumbers

1. Introduction

Rainwater tanks can make an important contribution towards reducing the demand for drinking water. However, certain requirements are necessary to protect reticulated drinking water and wastewater systems and to ensure public health is not compromised.

If the installation of a rainwater tank (regardless of size) involves work affecting the water supply system, sewerage system, stormwater drainage system, or any part of Sydney Water's systems, then such work can only be undertaken with Sydney Water's approval.

Sydney Water has developed the following guide on the technical and regulatory requirements for plumbing from rainwater tanks. This is to ensure that the rainwater service cannot accidentally backflow into the drinking water main or be cross-connected to the drinking water supply within the property. Any cross connection would change the quality of the drinking water.

As part of our Operating Licence and Customer Contract, Sydney Water has a responsibility to ensure that the quality of drinking water supplied to our customers is maintained. As the plumbing regulator in our area of operations, Sydney Water also has responsibility to ensure that the drinking water quality is maintained within the customer's property.

In this guide, you will find detailed requirements that must be met when installing drinking water top-up for rainwater tanks, technical drawings and fact sheets that your customers can obtain from the Sydney Water website.

You can find out more about rainwater tanks from our website www.sydneywater.com.au or by phoning our Plumbing Policy, Standards and Regulation group on 9952 0576.

Council Approval

The NSW government has amended the *State Environmental Planning Policy (SEPP 4)* so that rainwater tanks with a capacity of 10,000 litres or less do not require local council approval provided they meet the conditions outlined in SEPP 4. Details are provided in **Appendix 2**.

Installation of rainwater tanks with capacity above 10,000 litres still require local council approval.

2. The guidelines

a) Application

These guidelines apply only to the plumbing for rainwater tanks that collect water from the roofs of residential properties.

The guidelines do not apply to:

- Rainwater tanks that are not connected to the internal plumbing and do not have top-up from the reticulated drinking water supply.
- Tanks that collect ground water runoff.
- Roof plumbing to the tank.

Rainwater tanks on commercial and industrial properties need to comply with Sydney Water's *Backflow Prevention Policy* and the *New South Wales Code of Practice: Plumbing and Drainage*.

b) Rainwater uses

Rainwater can provide an alternative source for the following:

- toilet flushing
- garden irrigation
- washing cars
- filling ornamental ponds
- washing machines

In line with NSW Health recommendations, Sydney Water does not recommend the use of rainwater tanks for drinking purposes where a reticulated drinking water supply is available to the customer.

In this case NSW Health does not advise using rainwater for:

- ✗ drinking
- ✗ cooking or other kitchen purposes
- ✗ personal washing, such as baths, showers, hand basins and bidets.

2.1 Approval to install a rainwater tank

Under no circumstances is a rainwater tank permitted to be built over a Sydney Water maintenance structure or within any Sydney Water easement, regardless of tank size.

Tanks not connected to the plumbing

Sydney Water's approval to proceed is not needed unless the tank capacity is greater than 10,000 litres. If the tank capacity is greater than 10,000 litres Sydney Water needs to assess whether the tank is situated a sufficient distance from Sydney Water's sewer. This is the same requirement as for any proposed building application.

A plan illustrating the location and size of the proposed rainwater tank must be supplied. Sydney Water's standard building over sewer procedures will apply. If it is a sufficient distance from the sewer, then Sydney Water or a QuickCheck agent can give approval.

2.2 Sydney Water requirements

Below is a summary of Sydney Water's main requirements regarding plumbing for rainwater tanks for residential customers. **Note:** Words in *italics* are defined in Section 4.

- a) Sydney Water needs to be informed of all proposed rainwater tank installations so that the meter can be replaced with another containing a *backflow prevention device*.
- b) There must be no *direct connection* between the rainwater tank and Sydney Water's reticulated drinking water supply.
- c) An application must be made to Sydney Water if the property owner wants a top-up from Sydney Water's drinking water supply to the rainwater tank, as this is defined as an *indirect connection*.
- d) Top-up will be limited to a *trickle top up* to ensure that the water pressure to other customers is not compromised.
- e) Top-up to the rainwater tank is **not** permitted from the reticulated recycled water supply.
- f) In certain circumstances, Sydney Water can refuse to allow a connection from its system to the rainwater tank.
- g) Where a higher risk is assessed, Sydney Water may require the property owner to install a higher hazard *Backflow Prevention Device* at the property owner's cost.
- h) The overflow from the tank should be directed to the stormwater system. It must not discharge to Sydney Water's sewerage system.
- i) With all plumbing work, the plumber is required to make an application to Sydney Water at least two working days before the commencement of work.
- j) The plumber must arrange for the rainwater tank plumbing to be inspected by Sydney Water. The plumber must also submit a Certificate of Compliance to Sydney Water and the customer at the completion of the work.

3. Connecting properties to rainwater

3.1 Administrative requirements

- The plumber is required to apply to Sydney Water for a permit to do the work as they would when connecting any house service plumbing.
- Sydney Water’s plumbing inspector must be contacted when work is completed to carry out a final inspection of the property before the *Certificate of Compliance* is submitted to Sydney Water and the customer.

3.2 Rainwater tank plumbing regulatory requirements

- All plumbing work is to be done or supervised by a licensed plumber in compliance with these guidelines and the *NSW Code of Practice: Plumbing and Drainage*
- Under no circumstances is there to be *direct connection* between the rainwater service and the drinking water service.

Figure 1 provides a drawing of plumbing for above ground rainwater tanks with an *indirect connection* to the drinking water supply.

a) Approved materials

Materials used in the rainwater tank plumbing must comply with *AS/NZS 3500 Part 1 Water Supply Section 2 Materials and Products*

Approved materials are those which have gone through the product approval process and have had a licence granted to mark the product accordingly. The certifying body provides the manufacturer with the following licensed marks to indicate that the products comply with the relevant standard. To the right are the current three types of “Marks” that indicate that the product has been certified.



b) Pipes and labelling

Pipe materials to be used for rainwater need to be approved products and be clearly and permanently identified ‘**RAINWATER**’ continuously along the length. This can be done for below ground pipes by using identification tape (made in accordance with AS2648) or for above ground pipes by using adhesive pipe markers (made in accordance with AS1345).

Identification tape marked ‘**RAINWATER**’ must be at least 75mm wide. The identification tape is to be installed on top of the rainwater pipeline, running longitudinally, and fastened to the pipe at not more than 3 metre intervals.

Every rainwater tank outlet must be labelled ‘**RAINWATER**’ on a permanent sign. An example is shown in **Figure 2**. AS1319 provides direction as to appropriate layout, size and face materials for signs.

c) Proximity to other services

Rainwater pipes must be separated from any parallel drinking water service.

Above ground pipes

Any rainwater pipe installed above ground must be a minimum of 100mm away from any drinking water pipe.

Below ground pipes

Any rainwater pipe installed below ground must be a minimum of 300mm away from any drinking water pipe.

d) Backflow prevention

Check that all the following backflow protection is in place:

Above ground rainwater tanks

- Sydney Water has replaced the old meter with one containing an integral *dual check valve* for 20 - 25mm meters.
- For meters 32mm or above, you need to install a *dual check valve* adjacent to the meter.

Below ground tanks

- A *testable backflow prevention device* must be installed at the meter. It should be noted that for below ground tanks the cost of the device and its installation must be met by the customer.
- The device must be tested annually. The cost of this annual check is to be met by the customer.

Testable backflow prevention devices

These must be tested by a plumber accredited by Sydney Water. Accredited plumbers are listed on our website at http://www.sydneywater.com.au/html/yourBusiness/backflow/bckflw_plumber_search.cfm

A completed *Backflow Prevention Device - Inspection and Maintenance Report* must be forwarded within 2 working days of test completion to:

Sydney Water Corporation
Backflow Prevention Group
Chatswood NSW 2067

For information on device testing requirements call **1800 680 636** or check out our website.

e) Water meters

Where a rainwater tank is installed a meter with an integral dual check valve will be provided for each property with a current 20-25mm water meter. Property owners will be requested to advise Sydney Water when a rain water tank is installed at their properties for an Integral *dual check valve* water meter to be fitted free of charge.

20mm water meters with integral dual check valves

The *dual check valves* are built into the meters and will provide backflow protection to the drinking water supply system. There are no changes needed to the drinking water service installation requirements as the integral *dual check valve* meters are of the same length as existing meters.

Plumbers will be able to identify the new integral *dual check valve meters* by the longer “spud” at the end connection of the meter. The check valves will also be visible from the end of the meter and plumbers should ensure that they are not damaged during installation.

As Sydney Water will be providing 20mm drinking water meters with integral *dual check valves* plumbers may now use approved ball valves at the meter location as accepted in the Australian Standard AS/NZS 3500, Part 1, Clause 5.4. Using ball valves at the meter will lower the amount of water pressure loss within the drinking water service and minimise future maintenance.

Contact Sydney Water on 13 20 92 to arrange for a replacement meter with an integral dual check valve

f) Top-up service

The tank must meet Sydney Water’s storage tank requirements if top-up is required. The inlet drinking water service must have a *visible air gap* between the reticulated supply and the tank external to the rainwater tank.

The drinking water top-up service will only be permitted as a trickle top-up. This maintains the drinking water pressure for internal purposes when the tank is filling. It also limits pressure fluctuations when flow to the tank turns on/off.

Note: Top-up to the rainwater tank is not permitted from the reticulated recycled water supply.

Flow rate

For single residential properties, the flow rate of the trickle top-up into the tank from Sydney Water’s reticulated supply must be restricted to a maximum of 2 litres/minute.

For townhouse or unit development, the flow rate of the trickle top-up into the tank from Sydney Water’s reticulated supply must be restricted to a maximum of 2 litres/minute times the total number of townhouses or units in the development.

Note: Sydney Water will generally allow an *indirect connection* between the tank and the reticulated drinking water supply as long as the requirements outlined in 3a) to f) above are met. This is subject to the disclaimer that, in accordance with the Customer Contract, Sydney Water is not responsible for any water collected in a rainwater tank.

4. Definitions

| | |
|---|--|
| Above ground rainwater tank | A tank collecting roofwater only which is either: <ul style="list-style-type: none">• fully above ground or• at least half the tank is above ground and the view of and access to the inlet pipe, air gap and overflow pipe are unobstructed. |
| Backflow prevention device | A <i>backflow prevention device</i> is a device, to prevent the reverse flow of water from a potentially polluted source into the drinking water supply system. All <i>backflow prevention devices</i> need to comply with AS/NZS 2845.1 |
| Below ground rainwater tank | A tank collecting roof water only which is either: <ul style="list-style-type: none">• fully or mostly underneath the ground• where the view of and access to any one of the air gap, inlet pipe or overflow pipe is obscured by the ground or something similar e.g. rockery or garden bed. <p>There should be no possibility that surface run-off eg: on a sloping site will drain to a rainwater tank.</p> |
| Connection | See <i>direct connection</i> or <i>indirect connection</i> . |
| Direct connection | Direct connection occurs: <ul style="list-style-type: none">• where a pipe containing water from Sydney Water's reticulated supply is directly connected into a tank or pipe containing water from a rainwater tank, or• where the outlet of a pipe containing Sydney Water's reticulated supply is submerged beneath the surface of water from a rainwater tank. <p>Note: Direct connection is expressly prohibited in Sydney Water's Customer Contract (clause 8.4) because of the risk of backflow of tank water into the reticulated supply.</p> |
| Dual check valve (DCV) | A device to prevent backflow caused by backpressure, which incorporates two independently operating force loaded non-return valves. |
| Indirect connection | Indirect connection occurs between a rainwater tank and the Sydney Water supply where the outlet of a pipe containing drinking water from the Sydney Water reticulated supply is separated from the water in the rainwater tank by a visible air gap. This ensures that there is no possibility of the rainwater backflowing into the Sydney Water supply. |
| Reduced pressure zone (RPZ) | A backflow prevention device for high risk connections. |
| Standard connections | Connections of 20 - 25mm pipes. |
| Testable double check valve (TDCV) | A device to prevent backflow caused by backpressure, which has two independently operating force loaded non-return valves and incorporates specific test points for in-service testing. |
| Trickle top-up | Trickle top-up is the slow filling of the tank from the drinking water supply. It is designed to minimise effects on the reticulated system and allow for a reasonable re-supply into the tank over a period of several hours. |
| Visible air gap | The unobstructed vertical distance through the free atmosphere between the lowest opening of a water service pipe or fixed outlet supplying water to a fixture or receptacle and the highest possible water level of such fixture or receptacle. |

5. Related Sydney Water policies

Backflow Prevention Policy

Rural Water Supply Policy

6. Useful references

Sydney Water Customer Contract (2002) Clauses 8.1 and 8.4

Sydney Water Regulation 2000 Part 2 'Plumbing and Drainage'

NSW Code of Practice Plumbing and Drainage (Edition No 2) July 1999

AS/NZS 3500 National Plumbing & Drainage Code

NSW State Environmental Planning Policy (SEPP) 4

National Environmental Health Forum (1998)

Guidance on the use of rainwater tanks, NEHF Monographs, Water Series No. 3

NSW Health Circular 2002/1 -

Use of rainwater tanks where a reticulated water supply is available

For further information on these guidelines contact

Sydney Water

Plumbing Policy, Standards and Regulation

Phone **9952 0576**

Email plumbing@sydneywater.com.au

Figure 1

Plumbing configuration for rainwater tanks in urban areas with reticulated supply

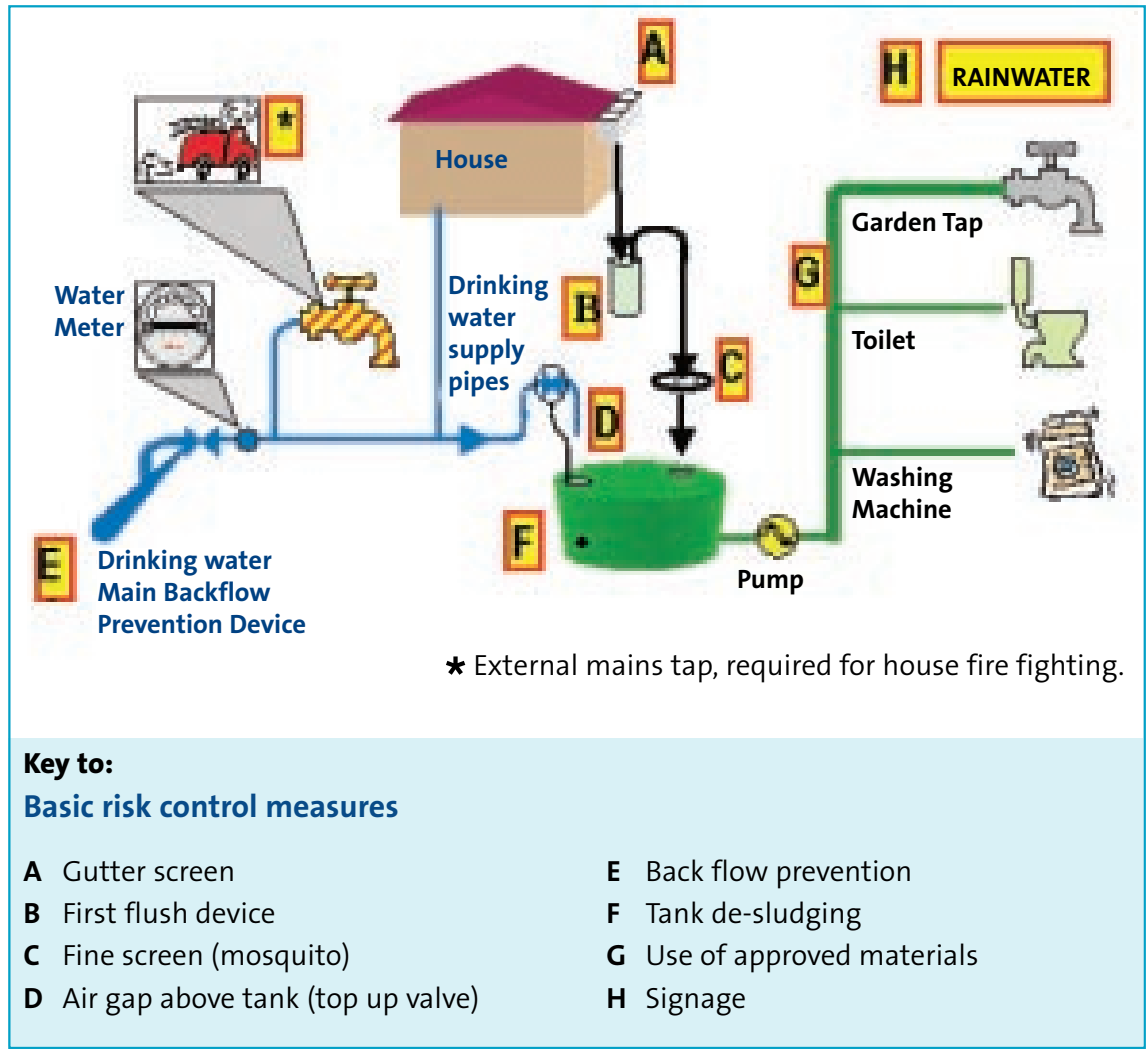


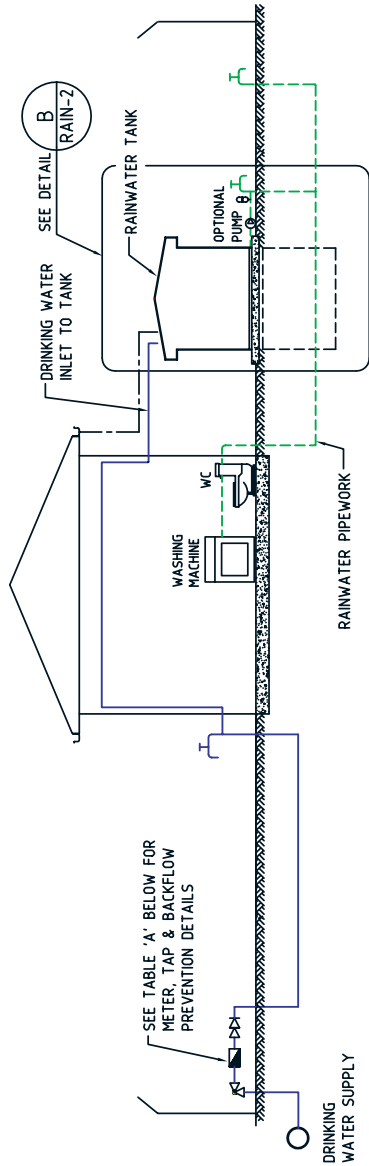
Figure 2

Signage for rainwater tanks and outlets

Note: Background colour should be **Yellow**
Text is **white** on a **black** background
Tap symbol is **black**



RAINWATER TANK WITH DRINKING WATER TOP UP - SINGLE RESIDENTIAL - SHEET 1



- DIAGRAM NOTES :
- DRAWING TO BE READ IN CONJUNCTION WITH SYDNEY WATER PLUMBING REQUIREMENTS
1. FOR TANKS 10,000 LITRES OR LESS, COUNCIL DEVELOPMENT CONSENT IS NOT REQUIRED, IF THEIR CONDITIONS FOR INSTALLATION ARE FOLLOWED.
 2. FOR TANKS GREATER THAN 10,000 LITRES COUNCIL DEVELOPMENT CONSENT IS GENERALLY REQUIRED.
 3. FOR TANKS MORE THAN 10,000 LITRES APPROVAL IS REQUIRED FOR BUILDING OVER SEWERS
 4. SYDNEY WATER'S APPROVAL IS REQUIRED FOR ANY TOP UP FROM DRINKING WATER SUPPLY, REGARDLESS OF TANK SIZE.
 5. NO DIRECT CONNECTION IS ALLOWED BETWEEN THE DRINKING WATER SUPPLY AND THE RAINWATER TANK SUPPLY.
 6. RAINWATER PIPEWORK IS SHOWN ON THE DIAGRAM AS SUPPLYING INTERNAL & EXTERNAL RAINWATER USES. CUSTOMERS MAY WANT ONLY ONE OR THE OTHER.
 7. THE INLET FILLING RATE FROM DRINKING WATER SUPPLY IS TO BE RESTRICTED TO A MAXIMUM OF TWO (2) LITRES PER MINUTE FOR EACH HOUSE, TOWN HOUSE OR UNIT SUPPLIED FROM THE TANK.

| RAINWATER TANK LOCATION | METER SIZE (mm) | TYPE OF TAP | TYPE OF BACKFLOW PREVENTION |
|-------------------------|-----------------|-------------|--|
| ABOVE GROUND | 20 | BALL VALVE | DUAL CHECK VALVE (COMBINED WITH METER) |
| | 25 | BALL VALVE | DUAL CHECK VALVE |
| | ≥32 | BALL VALVE | DUAL CHECK VALVE |
| BELOW GROUND | 20 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |
| | 25 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |
| | ≥32 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |

TABLE-A

LEGEND:

| | | | | | |
|--|-----------------------------|--|-----------------|--|-------|
| | BALL VALVE | | RIGHT ANGLE | | METER |
| | DUAL CHECK VALVE | | PRESSURE VESSEL | | |
| | PUMP | | | | |
| | GARDEN TAP | | | | |
| | DRINKING WATER SUPPLY PIPES | | | | |
| | RAINWATER SUPPLY PIPES | | | | |
| | DOWN PIPES | | | | |

Appendix 1
Technical
Drawings

Rainwater tank with drinking water top up
Single residential
Sheet 1

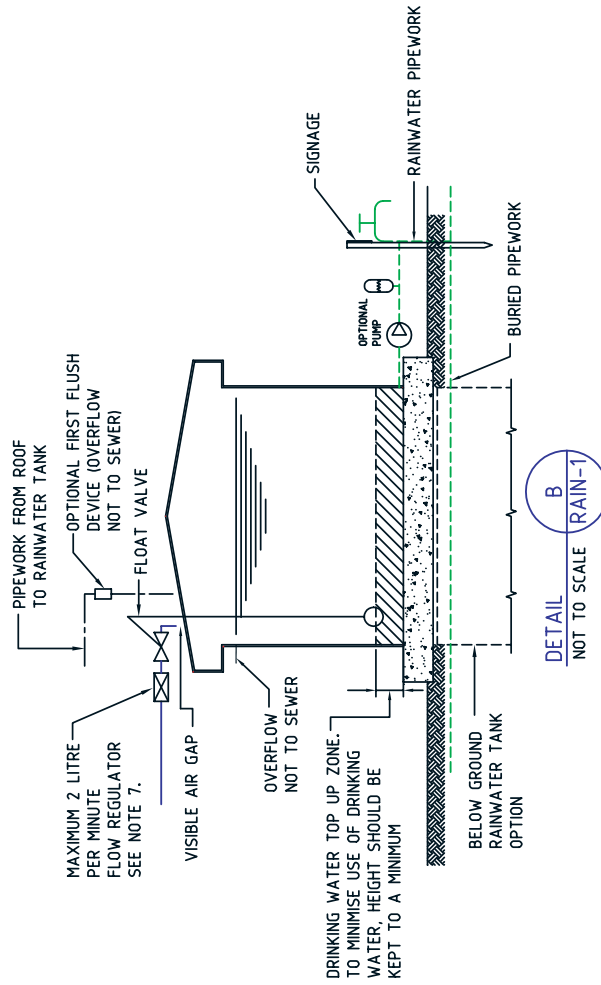
Appendix 1 Technical Drawings

Rainwater tank with drinking water top up

Single residential

Sheet 2

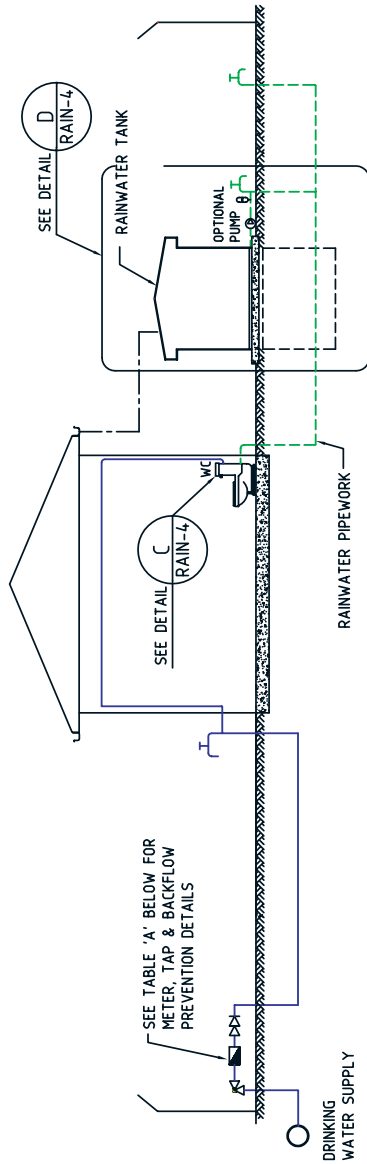
RAINWATER TANK WITH DRINKING WATER TOP UP - SINGLE RESIDENTIAL - SHEET 2



LEGEND:

| | | | |
|--|-----------------------------|--|-----------------|
| | PUMP | | PRESSURE VESSEL |
| | GARDEN TAP | | FLOAT VALVE |
| | DRINKING WATER SUPPLY PIPES | | FLOW REGULATOR |
| | RAINWATER SUPPLY PIPES | | |
| | DOWN PIPES | | |

DUAL DRINKING WATER AND RAINWATER SUPPLIES TO TOILETS - SINGLE RESIDENTIAL - SHEET 1



- DIAGRAM NOTES :
- DRAWING TO BE READ IN CONJUNCTION WITH SYDNEY WATER PLUMBING REQUIREMENTS
1. FOR TANKS 10,000 LITRES OR LESS, COUNCIL DEVELOPMENT CONSENT IS NOT REQUIRED, IF THEIR CONDITIONS FOR INSTALLATION ARE FOLLOWED.
 2. FOR TANKS GREATER THAN 10,000 LITRES COUNCIL DEVELOPMENT CONSENT IS GENERALLY REQUIRED.
 3. FOR TANKS MORE THAN 10,000 LITRES APPROVAL IS REQUIRED FOR BUILDING OVER SEWERS
 4. SYDNEY WATER'S APPROVAL IS REQUIRED FOR ANY TOP UP FROM DRINKING WATER SUPPLY, REGARDLESS OF TANK SIZE.
 5. NO DIRECT CONNECTION IS ALLOWED BETWEEN THE DRINKING WATER SUPPLY AND THE RAINWATER TANK SUPPLY.
 6. RAINWATER PIPEWORK IS SHOWN ON THE DIAGRAM AS SUPPLYING INTERNAL & EXTERNAL RAINWATER USES. CUSTOMERS MAY WANT ONLY ONE OR THE OTHER.

| RAINWATER TANK LOCATION | METER SIZE (mm) | TYPE OF TAP | TYPE OF BACKFLOW PREVENTION |
|-------------------------|-----------------|-------------|--|
| ABOVE GROUND | 20 | BALL VALVE | DUAL CHECK VALVE (COMBINED WITH METER) |
| | 25 | BALL VALVE | DUAL CHECK VALVE |
| | ≥32 | BALL VALVE | DUAL CHECK VALVE |
| BELOW GROUND | 20 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |
| | 25 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |
| | ≥32 | BALL VALVE | TESTABLE DOUBLE CHECK VALVE |

TABLE-A

| LEGEND: | |
|---------|-----------------------------|
| | BALL VALVE RIGHT ANGLE TYPE |
| | DUAL CHECK VALVE |
| | PUMP |
| | GARDEN TAP |
| | DRINKING WATER SUPPLY PIPES |
| | RAINWATER SUPPLY PIPES |
| | DOWN PIPES |
| | METER |
| | PRESSURE VESSEL |

Appendix 1 Technical Drawings

Dual drinking water and rainwater supplies to toilets

Single residential

Sheet 1

Appendix 1 Technical Drawings

Dual drinking
water and
rainwater
supplies to
toilets

Single
residential

Sheet 2

DUAL DRINKING WATER AND RAINWATER SUPPLIES TO TOILETS - SINGLE RESIDENTIAL - SHEET 2

