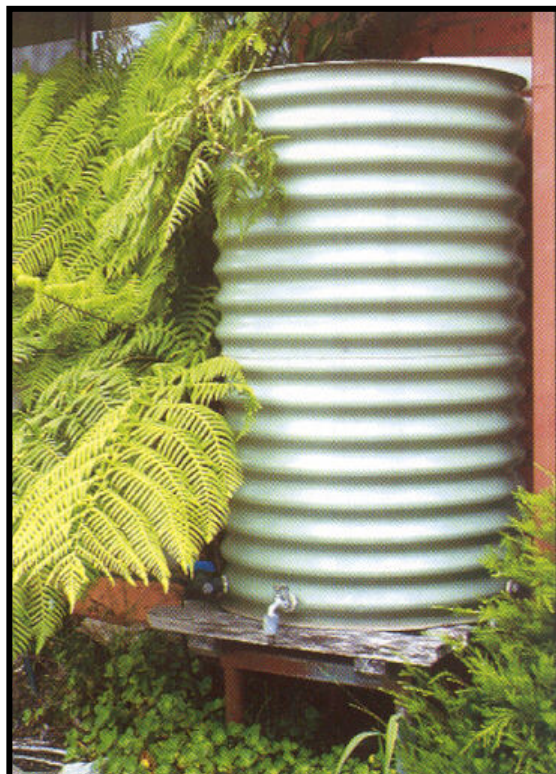




# **A Guide to Rainwater Tanks**



## **A Guide to Rainwater Tanks**

This kit aims to assist you to maximise the benefits from the use of rainwater tanks. Water use depends on its availability and its quality, both of which relate to costs. Consideration of your water requirements is essential to determine the right option for your situation. The following information details the factors you should take into account to ensure the appropriate choice to meet your needs.

### **TABLE OF CONTENTS**

What you need to know about Rainwater Tanks.....	3
How Rainwater Tanks work.....	4
Water Pressure Issues and Top-up Connection.....	5
Council Requirements.....	5
Sizes and Types.....	5
Types of Rainwater Tanks Available.....	6
Above or Below Ground Tanks .....	7
Planning and Building Requirements.....	7
Installation Requirements.....	8
Pumps .....	8
Maintenance .....	9
Health .....	9
Backflow Prevention .....	9



## **What you need to know about rainwater tanks**

Rain falls from the sky, so if you catch and store enough of it you would not only have a supply of cheap water but you would also have a supply of fairly pure water as well. This seems a simple conclusion; however, there are many factors to consider prior to making a decision to install a rainwater tank.

The cost of water from tanks can be more than town water and the quality can vary considerably. Thus, those contemplating installing rainwater tanks need to understand not just why they are doing it by also the actual outcomes they might receive.

Rainwater tanks have been seen as desirable as they contribute to our overall water resource usage and conserve water for the environment. For use on the garden or other non-drinking uses such as washing and toilet flushing. This generally requires a much larger tank (4,500 litres and above) as the primary purpose would be to reduce town water usage and save water for the environment.

Before you buy a rainwater tank, it's important to make a plan first so that you end up with a tank that best suits your needs and situation. If you intend to use rainwater in your home and garden, you need to install a tank with at least a 5,000 litre capacity. However, your tank size will also depend on your site's constraints. Use the checklist below to guide you when you talk to your tank supplier or plumber.

### **Things to consider:**

- Size and type of tank to suit your needs
- Available area to locate a tank
- Area of roof draining to the rainwater tank
- Extras like a pressure pump, ability to top up with drinking water, a backflow prevention device and a first flush device
- The suitability of your roofing materials
- Your budget
- What's involved in installation
- What kind of maintenance is necessary
- Council requirements
- Our regulations

Apart from purchasing a tank, there are a number of other possible expenses you need to be aware of including:

- delivery
- installation
- gutter, roof and downpipe alterations
- a foundation or tank stand for above ground tanks
- excavation work for below ground tanks
- backflow prevention devices
- a flow regulator

- first flush device, screens and gutter guards
- extra plumbing
- maintenance
- a pump if needed
- a pipe to top up if needed

After weighing up the cost of a rainwater tank and its associated expenses, you should also consider the long term benefits of purchasing a rainwater tank. This includes the savings in your water consumption costs.

### **How Rainwater Tanks work**

Rainwater tanks store rainwater run-off from catchment areas like your roof. In most cases, the water from your roof is funnelled along your gutters and into downpipes connected to your tank. If you are going to install a rainwater tank, alterations to your guttering may be required. To get the best out of your rainwater tank, it's important to install appropriate screens to stop debris and insects entering the tank.

The volume of water collected depends on the roof area available as catchment, the size of the tank and the rate of water usage. The following table gives an indication of the dimensions of various tanks:

#### Typical Tank Size

<b>Volume (KI)</b>	0.5	1.0	2.0	5.0	10.0	20.0
<b>Diameter (m)</b>	0.8	0.9	1.3	1.9	2.5	3.6
<b>Height (m)</b>	1.0	1.5	1.5	1.8	2.0	2.0

The table below gives an indication of the amount of water you could collect for use.

<b>Rainwater Tank Yield (litres per day) *</b>						
<b>Contributing Roof Area (m<sup>2</sup>)</b>	<b>Tank Size (kilolitres)</b>					
	0.5	1.0	2.0	5.0	10.0	20.0
50	20	25	40	55	65	
100	25	35	55	85	110	130
150		40	65	105	145	180
200		45	70	120	170	225
* Indicative only						

1 KL (kilolitre) – 1000 litres

## **Water pressure issues and top-up system connection**

If you are connecting your tank to the toilet or washing machine you will need to maintain a minimum level of water in your tank and will therefore need a top-up system. This will require you to engage a licensed plumber.

A top-up system will deliver water to your tank through a pipe from the Shoalhaven Water supply. An air-gap is required between this pipe and the rainwater tank. This is to ensure no backflow can go into the drinking water supply from your tank.

Shoalhaven Water requires that the flow from your top-up system be limited. If the flow rate is too high, it can affect the water pressure supplied to you and your neighbours. When you are topping up your tank, you will need a flow restrictor installed on the piping. This will ensure the water pressure supplied to your neighbours is not affected when you are filling your tank.

Your plumber can advise of the requirements of the top-up system for your property, including determining the air-gap required and flow rate restriction required.

## **Council Requirements**

Rainwater tanks with a capacity of 10,000 litres or less don't need council development approval, but will still be subject to certain council requirements. For example Council have location and plumbing requirements for tanks.

Please consult the council before installing a rainwater tank by filling in your "Rainwater Tank Compliance Checklist".

## **Sizes and Types**

It's important to make sure you get the right size rainwater tank to suit your needs. Generally, the larger the tank, the more reliable and effective it is in conserving water or managing stormwater. As a guide we recommend:

- A minimum size of 5,000 litres for non potable (non drinking) domestic water uses (eg flushing the toilet, in washing machines, watering the garden) and holding stormwater
- A minimum size of 2,000 litres when you have a small garden area to water

These size tanks would generally be sited on the ground and would require:

- A reasonable area within the lot
- May require modifications to guttering to direct water to the tank
- May need a pump to distribute water

If a property is connected to town water and also has a rainwater tank system, the following conditions will apply:

- Tanks, may be "topped up" from the town water only through an air gap, external to the tank meeting the requirements of AS3500.
- Rainwater tank systems may be interconnected with the town water supply system, but require an appropriate backflow prevention device. A licensed plumber is required to carry out all work relating to the installation of rainwater tank systems.

### **Things to consider**

- The number of people living in your home (if you want to use rainwater for toilet flushing)
- The amount of water you currently use
- The size of your garden
- Intended use of rainwater (eg garden, toilet flushing)
- Available fittings and components to suit your needs
- The size of the roof catchment area
- The location of the property (coastal areas are generally wetter than inland areas so a larger tank is required inland to be as effective as a tank on the coast)
- Local Council requirements

### **Types of rainwater tanks available**

In general the householder has available choice of rainwater tanks manufactured in either galvanised iron, concrete polyethylene or fibreglass.

For most house applications the tanks are manufactured under factory conditions and transported as a complete unit. Tank sizes are generally standardised and vary little from manufacturer to manufacturer.

#### **Polyethylene tanks**

Commonly known as 'poly' tanks, these tanks come in many sizes and colours and are suitable for both above and below ground use. They last a long time, are UV-resistant, often cost less and because of their lightweight and construction, are easy to transport.

#### **Metal tanks**

Metal tanks are light and easy to transport, are suitable for above and below ground use, can be custom made and are usually corrugated or straight rolled. They can be made from a variety of metals including:

- Galvanised steel – zinc-coated Z600 steel (prone to rusting)
- Aquaplate or Colourbond – coloured polymer-coated steel (lasts longest)
- Zinalume – silver-coloured zinc/aluminium-coated steel (prone to rusting)
- Copper and stainless steel – used for specialised applications.

#### **Concrete**

Concrete tanks can be built above or below ground. They're usually made on site and are durable and long lasting. Sizes up to 10 000 litres may be transported to site. They're good for preventing algal growth (light can't penetrate) and they keep water cool.

#### **Fibreglass tanks**

Fibreglass rainwater tanks are resistant to rust and chemical corrosion and are suitable for both ground and stand installations. They are tolerant of extreme temperatures, come in a large range of colours and sizes and, because of their lightweight construction, are easy to transport. Fibreglass tanks can be more expensive than other varieties.

## **ABOVE OR BELOW GROUND TANKS?**

### **Above ground tanks**

Advantages:

- easy to detect cracks and leaks
- can extract water via gravity and/or pumps
- can be raised off ground to increase water pressure
- usually cost less than below ground tanks

Disadvantages:

- take up space
- susceptible to weather
- require anchoring (to the ground) for when the tank has less water

### **Below ground tanks**

Advantages:

- save space and are unobtrusive

Disadvantages:

- more difficult to extract water from – usually need a pump
- hard to detect leaks or problems
- hard to empty when top is left on – difficult to drain for cleaning
- risk of contamination from groundwater or floodwaters
- if access point is left uncovered, there's a risk to public
- can be damaged by heavy vehicles driving over them
- excavation costs

Underground tanks require additional protection against entry of surface run-off or groundwater, animal or human faecal material and soils containing pesticides and fertilisers. These tanks need to be properly sealed and access points need to be protected against ingress of surface run-off. Maintenance and cleaning of underground tanks may be more difficult.

## **Planning and Building Requirements**

Once you have decided on the size and type of tank, you will need to find out about planning and building requirements in your area.

You should consult council before installing a rainwater tank by forwarding the “Rainwater tank compliance checklist”. Tanks with a capacity of 10,000 litres or less generally do not require council approval, however, tanks are subject to certain government requirements such as location, height, labelling of tank outlets and associated pipe work.

Do not install your tank in a Shoalhaven Water easement or over a sewer maintenance structure. If the tank has a capacity of 10,000 litres or more, check with Shoalhaven Water to ensure it is not located near a sewer main. Any overflow from the tank must run to the stormwater system, not the sewerage system.

## **Installation Requirements**

The following requirements and recommendations will ensure your tank operates efficiently and our water systems and the environment are protected.

If you are using the tank water indoors (eg. washing machine or toilet) you will need to maintain the minimum water levels in your tank. A licensed plumber will need to connect a 'top-up' system from Shoalhaven Water's mains supply, and your plumber can also assist with the following to meet Shoalhaven Water guidelines:

- Install a flow restrictor to ensure the flow rate of water used to top-up the tank does not affect you or your neighbours' water pressure.
- Leave a visible 'air-gap' between the pipe from the mains supply and the tank to ensure rainwater does not flow back and mix with you drinking water.
- If required fit a proper backflow prevention device to your meter.
- Label tank outlets and pipes as '**rainwater**'.
- Make sure there is no connection between the pipes carrying the rainwater and the pipes carrying the mains water unless appropriate backflow prevention devices are installed.
- The tank must be fitted with a first-flush device, being a device that causes the initial run-off of any rain to bypass the tank to reduce pollutants entering the tank.

In all cases, stormwater overflow from rainwater tanks must be directed to the stormwater drainage system and not the sewerage system

If you are installing a rainwater tank and have a standard sized (20-25mm) water meter, Shoalhaven Water will fit a new meter with a dual check backflow prevention device free of charge. In this case, if you have forwarded your "Rainwater Tank Compliance checklist", your meter will be identified under this process.

Residential customers or property owners with large water meters (32mm+) and all commercial and industrial customers will need to install a backflow prevention device at their own cost.

## **Pumps**

Elevated water tanks may provide sufficient water pressure, however, pumps may be necessary to effectively operate irrigation spray systems, solenoid valves in dishwashers and washing machines and cistern floats.

If your tank is not sufficiently elevated to allow gravity to provide the required water pressure, you will need to install a pump. Your installer can advise you about the range of pumps on the market.

Two or more tanks can be linked using a pump and there are many types and sizes of pumps available from both tank manufacturers and irrigation suppliers.

Low pressure cistern floats are also available.

All pumps require basic regular maintenance and need to be secured firmly on a concrete plinth and kept under cover.

Pumps have the potential to cause a noise nuisance to your neighbours if installed inappropriately. For example, a pump installed next to a side boundary fence near your neighbour's bedroom window is likely to cause a noise nuisance to your neighbour. Consider the placement of your pump and sound proofing that may be required to reduce a potential noise nuisance.

### **Maintenance Requirements**

It is important to maintain your rainwater tank and components to ensure they work effectively and supply high quality rainwater.

Regularly clean your roof, gutters, first flush devices and insect screens of leaves, debris and overhanging tree branches. If mosquitos are present, find out how they entered the tank and block their access.

Check the bottom and sides of your tank for sludge every two years. If sludge is present, you will need to either siphon the sludge out or empty the tank.

Sediment in the tank may block your irrigation system or discolour your toilet cisterns and washing machine. Check in the Yellow Pages for professional tank cleaners, if required.

Leaf traps will reduce contamination and sealing the tank from light will discourage the growth of algae and bacteria.

### **Health**

As rainwater falls from the sky, it's mostly free of micro organisms and other pollutants. However, during collection and storage, its possible rainwater can become contaminated.

Find out more about rainwater tank health guidelines from NSW Health [www.health.nsw.gov.au](http://www.health.nsw.gov.au) and the NSW Health Rainwater Tanks Brochure.

For this reason, NSW Health doesn't advise using rainwater for drinking when there's an alternative mains water supply available. Find out more about rainwater tank health guidelines from NSW Health.

It's important to find out if your roofing materials or the paint used in your catchment areas could contaminate your water tank. Speak to your rainwater tank supplier about testing roofing materials.

Good maintenance is the key to good water quality. Installing screens helps to keep physical contaminants out of your tank, as do first flush devices. Remember to regularly clean first flush devices, gutters and guards. The installation and maintenance of rainwater tanks shall comply with the *Guidance on Use of Rainwater Tanks, Health Council 2004*.

### **Backflow Prevention**

The Authority reserves the right to require greater backflow prevention or to disallow cross-connection if rainwater tanks are not installed or operated in strict compliance with the Authority's Plumbing Guidelines for Rainwater Tanks.

Where any sides of the rainwater tank are buried, the tank shall be treated as a fully buried tank for backflow requirements.

#### Backflow Prevention Requirements (Containment)

Rainwater Tank Location	Meter Size (mm)	Type of Backflow Prevention Containment
Above ground	$\geq 20$	Dual Check Valve (combined with meter) (non-testable device)
Fully or partially Buried	$\geq 20$	Vented Dual Check Valve

#### Backflow Prevention Requirements (Zone)

Rainwater Tank Location	Meter Size (mm)	Type of Backflow Prevention Containment
Above ground	$\geq 20$	Dual Check Valve (non-testable device)
Fully or partially Buried	$\geq 20$	Dual Check Valve (non-testable device)

Note: Where a Vented Dual Check Valve (VDCV) is not available in the required size a testable backflow prevention device shall be installed.