Rain Tank Design

Rainwater is a valuable natural resource that can be collected as an environmentally responsible way to provide real cost savings to any home or business. Homeowners are recognising the benefits of rainwater collection.

Waitakere City Council is considering some new promotions around a new generation of rain tanks, in line with its water conservation programme Water Wise.

The use of rainwater tanks in urban areas is expected to provide an overall benefit to the Waitakere City in terms of reduced water demand and increased environmental protection. Each rain tank can save a home about 50% in terms of their water usage when rain water is re-used for the laundry use and toilet. Tank water is entirely suitable for toilet flushing, laundry, carwashing and garden watering purposes. Such dual supplies need to be carefully installed to ensure that water from the tank cannot backflow into the public supply, and suppliers of new generation tanks include an easy installation service as part of their package. A building consent is required from the council.

Waitakere City Council has about 5000 customers who are on rural properties and west coast beaches, many of whom use rain tanks. We are also getting a growing number of urban rain tanks installed. In some cases this is a must, as council tries to protect our streams from harmful stormwater effluent in our streams.

Through the rain tank rebate scheme, homeowners putting in a rain tank can apply to get a $500 rebate and free associated building consent costs (see: rebate programme in this brochure). EcoWater is now looking at further incentives which could see new 'fashionable' slim line rain tanks becoming available.

Several homeowners and developers are already using these new generation urban rain tanks.

Instead of the larger circular tanks that take up a large part of a front or back lawn, the new generation rain tanks are available in a range of shapes, sizes and colours. They can be submerged under a house, next to a fence or under the front lawn. They can even be part of a landscaped water feature or a parking area for your car or boat.

We are working closely with Ecocity residents that have rain tanks to ensure they're getting the most out of them. In return, rain water tank homes are saving money on mains water, reducing stormwater run-off to our surrounding waterways and utilising natural resources.

Different Rain Tank Styles

Form and function come together in some of the new rain tank designs. Slim design and stylish rounded curves are new choices now available in the styles of urban rain tank households. Designed to sit closely against an existing wall, the slimmer vertical or horizontal rain tanks can be as narrow as 560mm in width. This makes them ideal for installation under eaves and other narrow spaces.

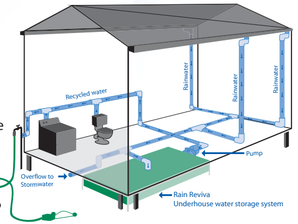
The Modular Rain Tank

Some come in rectangular shapes and are known as modular tank. Designed especially for homes, units and townhouses where space is limited, the design of this tank, combined with a variety of colours choices, ensure you can create a seamless blend with your home's architecture.
The tanks are available in un-painted galvanised or painted in your choice from a broad spectrum of colours. Such tanks can be an ideal match to your outdoor environment and landscaping.

Pumps and Accessories

Get the full potential out of your rainwater tank with the right pumps and accessories. A wide range of pumps are available. The pump you choose will depend on the tank size, the requirements of the appliance that will feed from the tank, and the diameter of the plumbing pipes and the pressure required.

If you choose to run your appliances solely from tank water, you may need a top-up facility to fill part of the tank with mains water when the rainwater gets low. When connecting to mains water, a backflow prevention device is needed to prevent the reverse flow of polluted water from contaminating drinking water. Some pumps have backflow and top-up devices built into their design. Separate top-up devices, backflow prevention devices and any pipes and fittings are available to complete the functionality of your rain harvesting system.



When making a decision about what tank, pumps and accessories are required for the application, call the council's customer services hotline on (09) 836 8400 to get some recommendations. When installing a rainwater tank, never attempt to install a tank to mains water without a qualified

Rainwater Barrels

Rainwater barrels are suited to smaller roof areas. They are good for watering the garden or washing the car. These are usually 240 litres and are reasonably priced. Do not use second-hand drums that have contained any toxic material, such as industrial chemicals.

Topping up

If you install a tank which is topped up by the mains supply you will need to install a backflow preventor to ensure the rainwater does not contaminate the mains water supply. Products are available to allow the mains supply to top up the tank if the water level falls below a pre-set level.

Cost

The average cost to buy, install and plumb-in a rainwater tank and pump for use in the laundry, toilet and garden, with a pump, is approximately $2,800 - $3,500.

Rebate programme

Waitakere City Council is offering a **rebate** to people installing tanks to existing or new homes for garden, laundry and toilet use. A rebate and a waiver of the Building Consent Fees are offered by the council if you meet the following conditions:-

The tank must:

- Be over 4500 litres (1000 gallons)
- Be used for supplying water to the laundry and/or toilet, and watering garden
- Not be the primary water supply
- Not be a condition of a building or resource consent
- Preference is given to tanks being installed into existing homes and to areas where stormwater is a problem

Please note other conditions apply. For further information or to get an application form, please contact the council's call centre on 836 0400 or www.waitakere.govt.nz

Do I need a building consent/permit?

A building consent is generally not required for tanks used only for garden irrigation. A building consent is required for any tank connected to household plumbing.

This includes rainwater collection systems that:

- connect to the mains water system as backup and therefore, require a backflow prevention device
- exceed 25,000 litres capacity and are supported directly by the ground
- exceed 2000 litres capacity and are supported more than two metres above the ground
- exceed 500 litres capacity and are more than four metres above the ground
- Tanks larger than 6000 litres may require a resource consent to ensure that they meet certain criteria such as distances in relation to boundaries, etc. Please check with the council's consent services department.

All plumbing must be carried out by a registered plumber and should comply with the New Zealand building code. This is covered by your building consent.

When installing a rainwater system, please ensure that:

"Not Suitable for Drinking" signage is fixed next to all rainwater system faucets.

Backflow prevention devices are installed to stop possible mains water contamination.

What else should you know?

- If you intend to collect rainwater from your roof, make sure the roof-paint is lead-free. Check your old paint for lead through your public health service.
- Regularly check and clean your gutters and tank to ensure they are clear of debris, leaves and dirt.
- Consider installing primary screening and first flush diverters and chlorinating the tank to improve your rainwater quality.

Please note:
If there are any changes in the colour or odour of your rainwater, contact your local public health service and avoid using the water for watering vegetable gardens.

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For more information about using rainwater, contact the Waitakere City Council Call Centre on **839 0400** or **www.waitakere.govt.nz**

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EcoWater
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Rainwater Tanks
In the urban area

Waitakere's ThreeWaters

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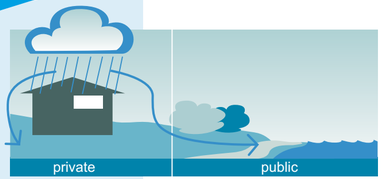


Stormwater can cause flooding, erosion and long-term environmental damage.

At Waitakere City Council we're upgrading our public stormwater systems, building stormwater ponds, filtering our drains and improving the quality of stormwater that flows into our streams and onto beaches. To make a real difference, everyone needs to take responsibility for stormwater on their property.

Waitakere City Council encourages you to adopt environmentally friendly stormwater practices in and around your home.

Why use rainwater?

Using rainwater reduces demand on the city's water supply and also helps you reduce your water rates.

Rainwater is free.

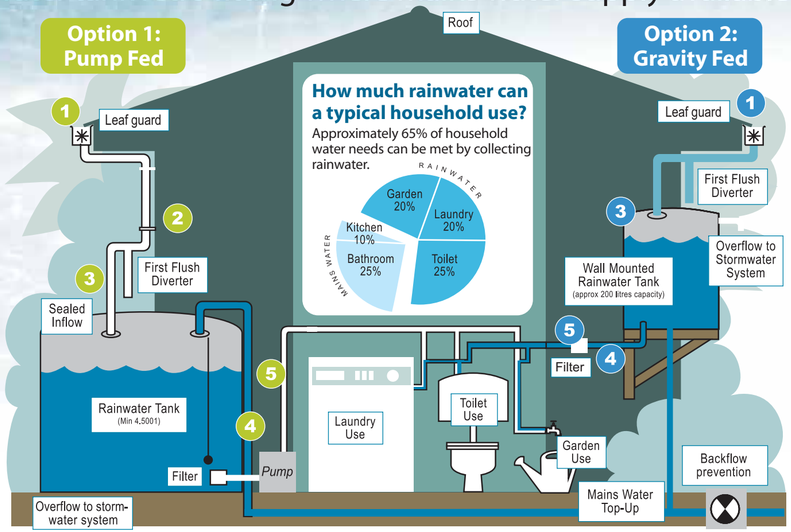
Using rainwater also reduces flooding and erosion by providing temporary storage for rainwater, this means less pollution of our waterways and less wet weather sewage overflows.

What can you use rainwater for?

Rainwater can supply up to 65% of your household's water. You can use it for:

- watering the garden and lawn
- washing vehicles
- supplying the laundry and toilet
- topping up spa's and swimming pools

Water tank retro fitting where mains water supply available



Why shouldn't you drink it?

Urban tank water is not recommended to be used for drinking, cooking and bathing due to potential contaminants.

If you wish to drink rain water you will need to have the quality regularly tested every six months and install filters.

Please contact the council's EcoWater staff who can provide further advice on how to use rainwater for drinking purposes.

Rainwater Uses:

Water your garden - **building consent not required.**

Garden, laundry and toilet gravity system with mains top-up (backflow preventer required) - **building consent required.**

Water your garden and supply laundry and toilet (no mains top-up) - **building consent required.**

Garden, laundry and toilet boosted (pump) system with mains top-up (backflow preventer required) - **building consent required.**

Components of a rainwater system:

Roof

Rainwater can be collected fom iron roofing, clay tiles and slates. It is important that no lead is used as roof flashing or gutter solder as the slightly acidic quality of rain can dissolve the lead and contaminate water supply.

1 Gutters and downpipes

Seamless extruded aluminium, galvanised steel or PVC are commonly recommended for gutters and downpipes. Gutters and downpipes must be properly sized, sloped and installed to maximise the quantity of rainwater collected.
The connection between the downpipes and the storage tank is generally made of PVC pipe.

Leaf guards are primary screening devices to prevent leaves and other debris entering the rainwater collection system.

2 First flush diverters

First flush diverters direct the first runoff from a roof after rain into a separate small chamber because, this water picks up most of the dirt, debris and contaminants (e.g. bird droppings). Typically 40 litres for every 100 m2 of roof area is diverted. Once the chamber has filled, the rest of the water flows to the downpipe connected to the rainwater tank. The small chamber has a small tube in the base that allows it to empty before the next rain.

First flush diverters are optional for non-drinking water use.

3 Storage tanks

above ground, below ground, or wall mounted (just under the gutter).

Options are available in tank materials (e.g. plastic, steel, concrete and fibreglass). The tank should have a durable, watertight, opaque exterior and a clean, smooth interior. A tight fitting top cover is required to prevent evaporation, mosquito breeding and keep insects, rodents, birds, and children out of the tank. It is best to locate the tank in a cool place, out of sunlight so that algae do not grow. A suitable overflow outlet and access for cleaning is also important. The tank should be placed high enough for gravity to convey the water, or be fitted with a pump.

The rainwater tank size will depend on: the *volume* of water needed; the *amount* and pattern of rainfall; the *area* of the collection surface; and the security of the *supply* needed.

4 Pipes

the delivery system for the collected rainwater.

Effective plumbing is important for efficient rainwater collection and to protect your household or mains water supply from contamination. Debris needs to be diverted and backflow preventers may need to be installed. We recommend that all plumbing be carried out by a qualified plumber. You are required to meet recognised plumbing standards.

5 Water treatment for non-potable (non-drinking) use

Additives for settling sediments or buffering pH and simple filters are optional treatments for non-potable (non-drinking) uses of rainwater. Fine filters and microbiological disinfection are only necessary for drinking water.

It is important to note that water quality may be affected by dirt, rust, scale, bird and rodent droppings and airborne bacteria may still enter the tank even when primary screening and first flush diverters are in place. Even for non-drinking uses, sedimentation of suspended solids inside the tank and further filtration is often a good idea.

Fine filters may be installed prior to the end use - e.g. at the washing machine and toilet cistern. Simple cartridge filters similar to those used for domestic swimming pools or hot tubs, are suitable (e.g. 80 micron washable filters). For best results follow the instructions for operation, maintenance and replacement of the filters.

Before making a decision about what water treatment methods to use, have your water tested by an approved laboratory and contact with your council resource consents staff or your public health service.

Tanks

Tanks come in a variety of sizes, however even small tanks can provide significant quantities of water for use around the house.

There are different types, styles and shapes of tank available. The most common are polythene or concrete and they can either go above or below ground. Putting your tank underground is a good option for urban dwellers with smaller sections.

To use a tank to flush the toilet and/or for laundry use you will either need to install the tank up high to create sufficient gravity or install a pump.

The installation of a 4,500 litre tank for collecting rainwater from a typical 150 m2 roof can reduce peak stormwater flows by 20% - 35%.

What size tank do I need?

The size of tank you need will depend on the following factors:

- How you plan to use the rainwater
- The amount of water you use
- The roof area available to collect water from

Rain Tank Capacity (in litres)

Average water use in litres/day	200	1,000	3,000	4,500	9,500
125	50%	80%	95%	100%	100%
225	40%	65%	85%	90%	100%
325	35%	50%	70%	80%	90%

Average yearly % of water supplied (for 150 m2 roof area)