

## RAINWATER HARVESTING

### INTRODUCTION

The collection, storage and use of rainwater has potential for considerable reduction in the requirement for potable (mains) water supply. This TECHnote suggests ways that a NATSPEC based specification can be used to specify a rainwater harvesting system.

### STATUTORY REQUIREMENTS

The design and installation must comply with the NCC and PCA. It will also need to comply with the requirements of the local government authority, plumbing regulator and the network utility operator where there is also a mains water supply. The relevant local government authority may, for example, mandate minimum setbacks, tank size and location.

In most instances, if a mains supply is available, rainwater for drinking is not permitted, but it may be used for irrigation, toilet flushing, laundry, swimming pool top-up and similar uses. In rural areas where no mains supply is available, local health departments should be consulted on the need for additional filtration and treatment to make the water suitable for drinking.

Backflow prevention to AS/NZS 3500.1 Section 4 will be required in mains connected systems.

### DESIGN ISSUES

Rainwater harvesting should be designed as an integrated system incorporating collection, contaminant removal, pumping, control and reticulation.

A significant design factor will be storage, as tanks are generally large and may impose significant architectural challenges. Fortunately, a wide choice of tank shapes and materials are available including corrugated steel and plastic, tanks designed for location below ground and bladder types suitable for sub-floor spaces.

Greater flexibility in tank location can be achieved by using a charged (wet) system in which some of the piping between the catchment and tank is permanently full of water. Since these are pressurised, the catchment, rainfall intensity and pipe lengths need to be considered to determine the head pressure. Also consider means for inspection and cleaning of horizontal below ground piping.

In most situations, the low available pressure from tanks and/or their location will make pumping essential. The pump system should incorporate

either a diaphragm tank to limit the number of pumps starts per hour or a motor specially designed for very frequent starting. The system should also include strainers or screens to protect the pump from debris and, if mains connected, automatic tank-to-mains changeover so that mains water is used when the tank is nearly empty.

The design should minimise the risk of contamination by providing leaf screens and a first flush diverter. The first flush diverter discards the initial flow of water from a rain shower, reducing the amount of dust and other contaminants that have collected on the catchment area. In most areas the discharge from the first flush diverter and the overflow from the tank must be treated as stormwater. Some authorities permit discharge onto grassed and similar areas.

Tanks also should be protected from entry of other foreign matter, vermin and insects, particularly mosquitoes. It is preferable that trees do not overhang the roof catchment area. Provision should be made for draining and cleaning tanks.

For safety reasons, tanks must also prevent unintended entry, particularly of children and animals.

For further information, SA HB 230 provides a comprehensive guide to the design of rainwater harvesting systems.

### NATSPEC PROVISIONS

The various *Roofing* worksections cover roof plumbing.

**0224 Stormwater - site** covers stormwater generally.

**0814 Hydraulic pumps** covers pump pressure booster systems and controls, including automatic tank to mains changeover.

**0816 Hydraulic services tanks** cover polyethylene, bladder, metallic-coated steel and concrete tanks.

**0821 Stormwater - buildings** covers systems related to buildings including internal stormwater piping for roof water and simple external systems.

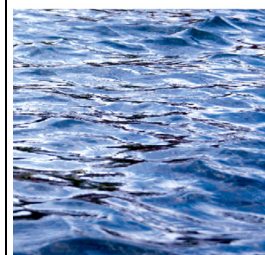
**0823 Cold and heated water** covers reticulation of the stored water.

**0825 Rainwater storage systems** covers rainwater storage systems and ancillaries.

**0826 Greywater systems** covers another approach to water conservation.



Save rainwater



Rainwater Tank Design and Installation Handbook



Domestic rainwater tank installation



Bladder type tank in sub floor space

### Relevant standards

AS/NZS 3500 (series) *Plumbing and drainage*

Part 0 *Glossary of terms.*

Part 1 *Water services.*

Part 3 *Stormwater drainage.*

SA HB 230 *Rainwater Tank Design and Installation Handbook.*

### Relevant websites

Rainwater Harvesting Australia

[www.rainwaterharvesting.org.au](http://www.rainwaterharvesting.org.au)

### Relevant worksections

**0224 Stormwater - site**

**042 Roofing** subgroup

**0802 Hydraulic design and install**

**0814 Hydraulic pumps**

**0816 Hydraulic services tanks**

**0821 Stormwater - buildings**

**0823 Cold and heated water**

**0825 Rainwater storage systems**

**0826 Greywater systems**