

# urban water solutions

water innovation it's your future

- create your own water supply
- keep your garden green
- have freedom in your water use



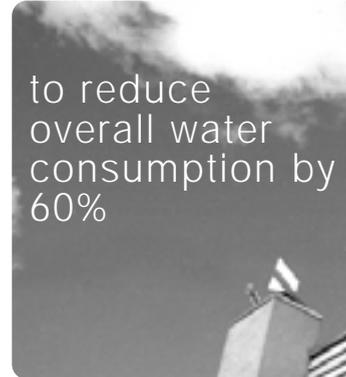
supported by  
Smart Water Fund

 H2O-me group

# urban water solutions

a guide to water and energy efficient residential buildings

eme group undertook this project, with the support of the smart water fund, the aim:



- water saving facts & figures • water storage & collection solutions
- water saving products • demonstration projects • a water tank reference guide

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“(eme group) like minded professionals exploring the potential of ecological and socially sustainable principles in their work...”

Environ (architecture) magazine



• residential • urban design • education • commercial • furniture • installations • eco initiatives

**eme aims** – create designs that exceed client expectation.

**eme approach** – enjoy the task of unearthing the inherent qualities within the client brief. We see the importance of strong and beautiful architecture that operates both practically and responsibly. **eme process** – embraces natural systems. Innovative, common sense and inspirational solutions, client ownership of the project, and a shared path through the complexities of design.

**eme future** – provides clients with the tools to make decisions now, with a vision of the future.

- future value
- future environments
- future water
- future living
- future lifestyle changes require flexible buildings

## water saving in the home

More than 90% of rain that falls in urban areas is not collected for use.

This run-off mixes with contaminated water from paved areas and roads and is discharged into our waterways, resulting in polluted rivers and beaches. Together, we have to place a higher value on this resource and treat water with the respect it deserves.

Over 85% of Australians live in urban areas. Urban dwellers must form a critical mass of water savers and bring about real and practical change.

Achieving dramatic change is simple.

Choosing quality water saving fittings and installing a tank in your home can significantly reduce the strain on our reservoirs. We do not need drinking quality water to flush our toilets or to water our gardens. Why not use tank water for these tasks?

We can all be 100% water responsible without sacrifice and feel good about taking care of our environment.



# home solutions **first steps**

A combination of water saving fittings and responsible water habits will save our precious water for the future

"there is more waste water generated and dispersed today than at any other time in the history of our planet" Estimation for 2002, by the World Health Organisation/Unicef



> water consumption around the home  
source: yarra valley water



As a first step in your water saving, there are many cost effective actions and products that can dramatically reduce your water usage.

The typical Melbourne home uses approximately 200,000 litres of water each year.

This averages out at a little over 548 litres per day.

## water fittings

Fitting flow regulators and using water saving and water efficient taps and shower heads, can dramatically reduce water usage. A very cost effective water saving measure.

## toilets

Replacing an old style toilet cistern with a new 6/3 dual flush saves up to 10 litres per flush (4.5/3 dual flush available). Another cost effective water saving measure.

## washing machine

A front loader AAAA washing machine uses 50% less water, 40% less energy and 50% less detergent than a top loader. Don't wash half loads. There are many models to choose from, with quick wash programs.

## dishwasher

Only consider a AAAA rated dishwasher with a high energy rating.

## watering the garden

Gardens consume a large amount of water. Using mulch is an effective way to minimise evaporation.

Choose a dripper or sub-surface irrigation system... this ensures the water reaches the plants without being evaporated or blown away.

Consult your local nursery for advice on water wise plants.

For further information  
[www.savewater.com.au](http://www.savewater.com.au)



# tank styles & design solutions

The benefits of a water tank in your home are substantial. With a water tank you can have greater flexibility during water restrictions, save on water bills, add value to your property, and help the environment.

A tank allows you to easily control your own personal reservoir and sustain a green garden. Innovative tank designs can be easily installed in existing homes. With a tank you can feel good about using free water and valuing it. For the optimal tank size see chart on page 18.



“the installation of a water tank system not only adds value and a point of difference, it provides peace of mind”

Richard Crane – Cocoon Real Estate

## corrugated iron tanks

- above ground system
- variety of sizes
- traditional look
- custom sizes available

## polyurethane & fibre reinforced tanks

- under certain circumstances these can be placed below ground
- variety of sizes
- tough & durable

## slimline polyurethane & corrugated iron tanks

- perfect for inner city houses up to 3,000 litres
- variety of sizes, shapes & colours

## bladder tanks

- flexible, durable, low profile (only 500mm clearance required)
- custom sized
- can be concealed under house, deck, etc.

## underground systems

- submersible tanks
- modular water systems
- variety of sizes, shapes & configurations



above ground tank



under decking



underground tank

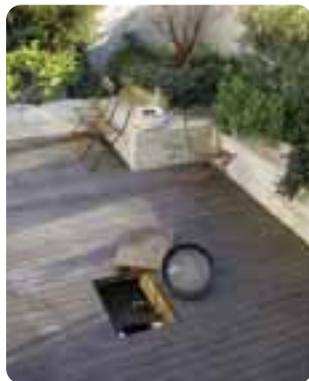
# case study 01

## compact city block prahran

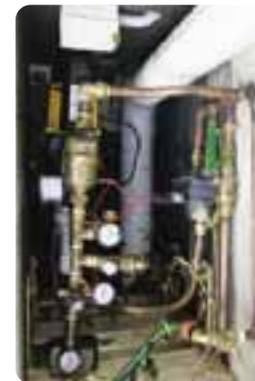
"my tank saves 4,000 litres every month" faye officier

Early integration of the water tank saved thousands of dollars and resulted in a very cost efficient solution.

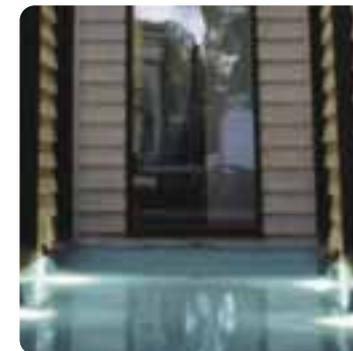
The water tank and pump installation represented less than 1% of the construction costs, including landscaping.



> 5,500 litre rainwater tank beneath entertaining area



> aquasense manifold and pressure pump concealed in planter box



> entry water feature

### environmental considerations

- water feature provides evaporative cooling
- 5,500 litre fibreglass tank submerged under the deck
- water harvesting system
- water efficient AAA fittings
- inverse hebel block veneer

**brief** adaptable home with integrated work studio for melbourne fashion designer

Located in an inner suburb, this design for a double storey residence merges sustainable principles and urban context with unique spatial planning and materials.

The client required a flexible space that is easily redefined to suit her contemporary lifestyle. Spaces evolve from night to day, from work to entertaining, and for a changing number of occupants.

The house makes vivid the daily passage of the sun and the cycle of the seasons through a centralised reflection pond and strategically positioned glazing.

In addition to its unique design, the home features advanced energy and resource-conscious features. A 5,500 litre water storage tank has been concealed under a timber decked courtyard. Rainwater is collected from the roof, stored in the tank and used to flush toilets and for garden irrigation.



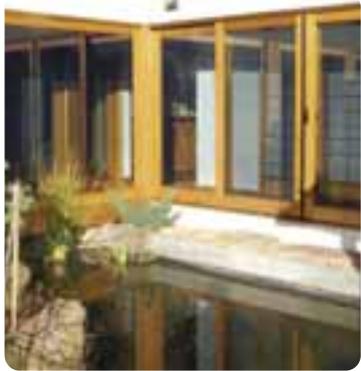
# case study 02

typical suburban block mitcham

The tank could easily have been installed in the backyard, after the house was completed.

Retro-fitting can be an inexpensive and unobtrusive way of maximising water savings for many existing homes.

"our home has reduced it's water consumption to less than 110 litres per person per day" Michael Corrie



> the home bridges across a Japanese fish pond



> 10,000 litre water tank concealed in back corner



> traditional Japanese tea room



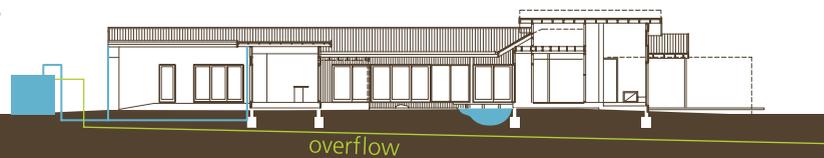
> Japanese bathroom opening onto rock water feature



## environmental considerations

- re-use of existing building materials
- water collection & storage
- use of Japanese water garden & coolgardie evaporation effect to aid in cooling home
- recycled water for irrigation
- recycled water to flush toilets

**brief** a unique, stand alone home on a typical suburban block – a home for a Japanese-australian couple that reflects their culturally hybrid lifestyle



The design achieves a balance between the beautiful sensibilities of Japanese architecture and site responsive Australian architecture.

Incorporating a formal Japanese tea room, the key spaces in the home are linked by a spine, inspired by the Japanese Roka that borders the northern Japanese water garden.

The home incorporates a 10,000 litre rainwater collection tank that services the toilets and satisfies the garden irrigation needs. The client's enthusiasm for water saving is reflected in the selection of water efficient AAA rated fittings, and their daily water use routine.

This home shows the possibilities for those of us who live on a typical suburban block.

# case study 03

## medium density homes brighton

These townhouses have become a council benchmark for energy efficient design and architectural innovation.

As a result of eme's focus on environmental efficiency, the local council agreed to increased housing density for the development.



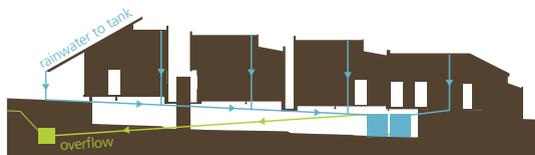
“water is the elixir of life; without it, this planet would have remained barren” David Suzuki

### environmental considerations

- 2 x 10,000 litre tanks
- water harvesting systems
- water efficient AAA fittings
- low-flow taps & shower heads
- wind cooling system

**brief** a medium density development that responds to the site and uses harvested water

Located a stone's throw from the Bay Street shopping strip, this design is an example of the new trends in ecologically responsive, medium density housing.



The four homes feature passive solar design, cross ventilation and significant harvesting of rainwater.

Water is collected from the roof, filtered and stored in two 10,000 litre tanks in the basement car park. This water is used for flushing toilets, garden irrigation and car washing. This reduces reliance on mains water and relieves pressure on public stormwater systems and ultimately on our beaches and waterways.

Energy efficiency is a prime consideration in the design. Living spaces are located on the first floor and oriented to the north, maximising light and energy from the sun.

The roof form acknowledges the surrounding homes and capitalises on seasonal weather patterns. Capturing cool sea breezes in summer and gently directing them through the building, the roof form provides natural, free cooling.

These homes will save more than 250,000 litres of drinking water every year and reduce energy consumption by more than 30%. This represents savings in the order of \$10,000 over a decade for each home.



# water management education



An educational installation created by eme, located at the Melbourne Water Discovery Centre, Werribee.

Tank city is a human scale city of water tanks to explore. The installation focuses on the value of capturing rain and stormwater for re-use in the city.

[www.emegroup.com.au/tankcity](http://www.emegroup.com.au/tankcity)

# optimal tank size

1 square metre of roof  
x 1 millimetre of rain  
= 1 litre of water

Often people underestimate how much water they can collect and use from their roof and select a tank that is too small. You should aim to maximise the amount of water you can capture and stop it going down the drain.

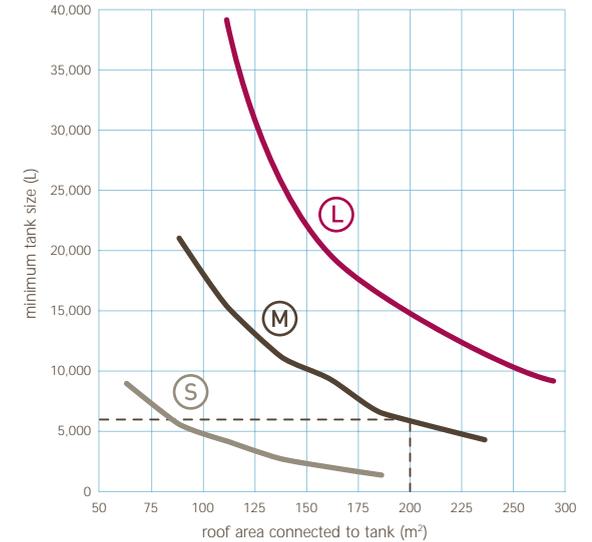
Dramatically improve the effectiveness of your rainwater harvesting by maximising the roof area connected to tank.

Some questions worth considering when selecting a tank:

- how big is your roof?
- how much rainfall do you get in your area?
- how much space do you have for a tank?
- how many occupants?
- what type and size of garden?

The choice of tank will ultimately come down to the design requirements of each house, the volume of tank water required and its proposed application. To obtain maximum yield/benefit from your tank connect it to supply the toilets, irrigation and washing machine.

The chart below is a rule of thumb guide that relates roof collection with tank capacity. Increasing the size of the tank above the line is encouraged.



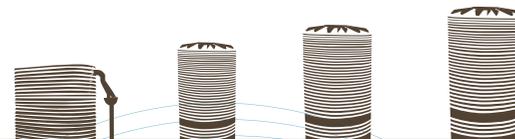
**L** Large Household: Large residence with large garden and five full time occupants

**M** Medium Household: Medium sized residence with two full time occupants

**S** Small Household: Inner city residence with courtyard garden and two full time occupants

--- Example: Medium household collecting water from 200m<sup>2</sup> of roof, optimal tank = 6,000 litres. However, for a medium home finding the space for a 10,000 litre tank would give you more available water in dry spells.

Yearly rainfall varies considerably across Melbourne. The above chart has been calculated on the average rainfall of 700mm/year. Please refer to the map on page 21 for more specific information on the rainfall in your area.



# water tank suppliers quick reference guide

“there is a water crisis today. but the crisis is not about having too little water to satisfy our needs. it is a crisis of managing water so badly that billions of people—and the environment—suffer badly.”

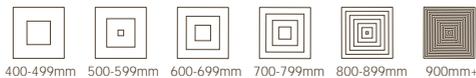
World Water Vision Report

manufacturers	phone	suburb/town	tank capacity	material	colour	slim line	under ground	bladder tanks	website
A1 Water Tanks	03 5331 6510	Ballarat	300 - 32,000L	aquaplate/galvanised	galvanised/colours				
Atlantis Water Management	02 9417 8344	Sydney/Melbourne		plastic	black		1,000L +		www.atlantiscorp.com.au
BlueScope Water Pty Ltd	1800 654 774	Keysborough	180 - 27,000L	aquaplate®	colours	1,000 - 5,000L	3,500L		www.bluescopewater.com
Bushman Tanks	03 5592 1888	Terang	509 - 47,950L	poly	colours	500 - 2,350L	3,400 - 10,000L		www.bushmantanks.com
BVCI Group Pty Ltd	03 5335 8741	Ballarat West	450 - 27,240L	poly	colours	495 - 675L			
Float Pac	03 9548 4700	Springvale		bladder	black			300 - 20,000L	www.floatpac.com
Invisible Structures Pty Ltd	03 5263 1997	Anglesea		recycle poly	black		1,000L +		www.invisiblestructures.com.au
Kathro Products - Hart To Hart	03 9706 6700	Dandenong	230L	stainless steel	stainless steel				www.harttohart.com.au
Tankmasta	1800 826 562	Carrum Downs	600 - 45,000L	poly	colours	600 - 1,000L	3,000 - 5,000L		www.tankmasta.com.au
OPS Country Tanks	03 5940 2191	Pakenham	520 - 27,900L	poly	colours				www.opstanks.com.au
Polymaster	1800 062 064	Swan Hill	200 - 31,700L	poly	colours	500 - 5,000L	2,250 - 5,000L		
PC Ridgeway & Co Pty Ltd	03 9330 2333	Airport West	100 - 45,400L	poly	colourbond colours	600L	3,500 - 5,500L		www.pcridgeway.com.au
Tankworld	1800 686 970	Swan Hill	225 - 45,500L	fibreglass/poly	colours	450 - 2,000L			www.tankworld.com.au
Team Poly	08 8326 2256	Lonsdale, SA	545 - 27,000L	poly	colours	1,140 - 2,500L	3,500 - 5,000L		www.teampoly.com.au
Water-store Products	03 5435 2388	Marong	225 - 33,750L	poly	colours	335 - 2,500L			www.waterstore.com.au
New Water	1300 552 695	Ringwood		bladder	black			2,000L +	www.newwater.com.au
Nylex Water Solutions	1300 092 837	Pakenham	330 - 45,400L	poly	colours	600 - 2,100L	5,000L	2,100L	www.nylexwater.com.au
Waterwall Solutions Pty Ltd	03 9689 3055	Kingsville		poly	colours	1,200 - 2,400L			www.waterwall.com.au



Note: Not all manufacturers and/or suppliers offer a delivery and installation service. A water tank must be installed by a certified plumber. Often a company will recommend and/or organise a plumber to install your water tank. Finding a plumber close to the placing of the water tank will have less environmental impact in terms of transportation.

# water tank melbourne rainfall



## links

- the smart water fund  
[www.smartwater.com.au](http://www.smartwater.com.au)
- the environmental protection authority (epa)  
[www.epa.vic.gov.au](http://www.epa.vic.gov.au)
- savewater  
[www.savewater.com.au](http://www.savewater.com.au)
- the csiro  
[www.csiro.au](http://www.csiro.au)
- greenplumbers  
[www.greenplumbers.com.au](http://www.greenplumbers.com.au)
- the department of sustainability and environment  
[www.dse.vic.gov.au/dse/](http://www.dse.vic.gov.au/dse/)
- ata-alternative technology association  
[www.ata.org.au](http://www.ata.org.au)
- the sustainable living foundation  
[www.sustainablelivingfestival.org](http://www.sustainablelivingfestival.org)
- [www.emegroup.com.au/urbanwater](http://www.emegroup.com.au/urbanwater)

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## thank-you

eme would like to thank all who contributed and supported this project.

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Harvest is an environmentally responsible paper. Manufactured under environmental management system ISO 14001. Harvest contains 70% alternative fibre (bagasse) and 30% elemental chlorine free (ECF) softwood pulp sourced from sustainable, well managed forests.

# did you know?

In one hour of rain a family home could collect up to 6,000 litres of water.

By collecting water at homes we can dramatically improve the ecological condition of our bays and rivers.

Taking a four minute shower instead of a six minute shower will save 10,000 litres in one year.

Installing an efficient shower head saves nine litres of water a minute, or 10,000 litres per person per year.

For additional information or copies of this booklet visit:  
[www.emegroup.com.au/urbanwater](http://www.emegroup.com.au/urbanwater)

