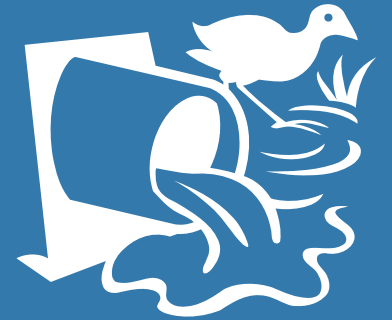


Stormwater Management

Building design for a sustainable future



What's included in this fact sheet:

Why do we need to change our Stormwater Management practices?

How will best practice Stormwater Management benefit me?

How does my choice of Stormwater Management strategies impact on the environment?

Some basic guidelines to manage stormwater:

- Rainwater tanks
- Porous paving
- Raingardens
- Drought tolerant landscaping

Measuring Stormwater Management performance

Where can I find out more?

Mandatory Requirements

Council's Best Practice Standard.

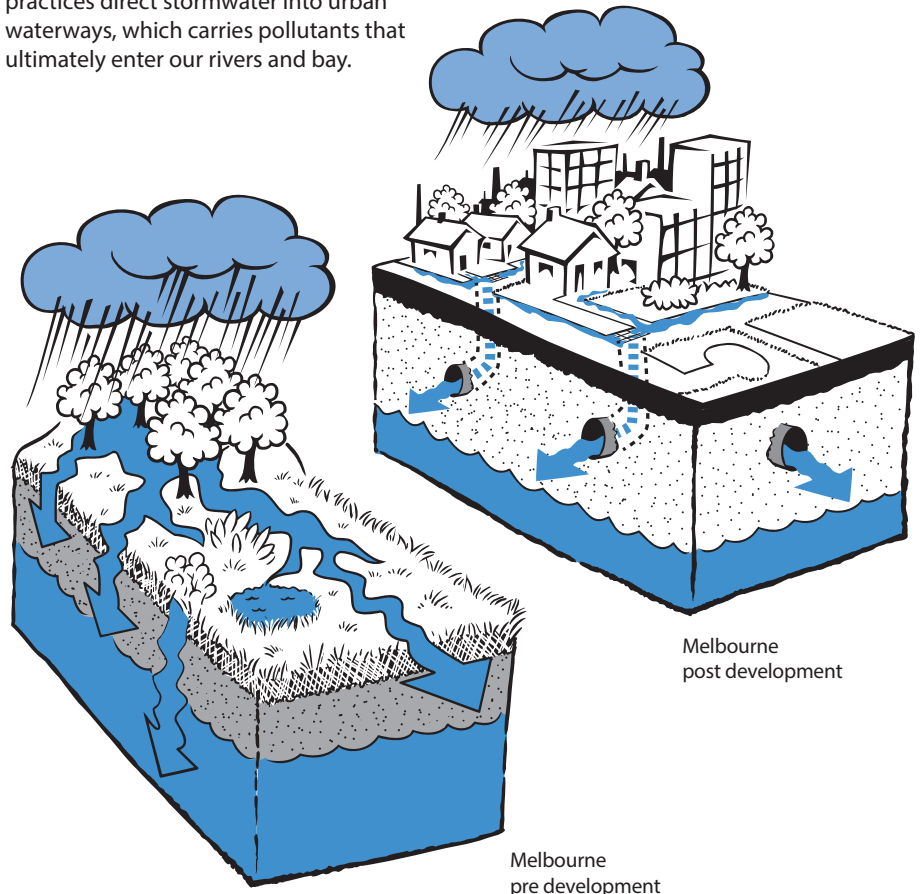
This fact sheet will assist you in making informed decisions about Stormwater Management practices to minimise negative impacts on the environment.

Why do we need to change our Stormwater Management practices?

Geelong's continued urbanisation and expansion has resulted in a dramatic increase in areas of hard and impervious surfaces, such as buildings, roads and car parks. Consequently, the majority of the rain that falls in urban areas is converted into run off, or stormwater.

Traditional stormwater management practices direct stormwater into urban waterways, which carries pollutants that ultimately enter our rivers and bay.

The increase in stormwater negatively affects the health and amenity of our waterways for people, plants and animals. Additionally, the large volumes of stormwater entering our waterways can cause flooding that damages both natural and built environments.



Some basic guidelines to best practice Stormwater Management



How will best practice Stormwater Management benefit me?

Water Sensitive Urban Design (WSUD) can capture, treat and reuse stormwater onsite to dramatically improve the quality and quantity of water entering our waterways. Integrating WSUD into your development will minimise its downstream impacts and also enables you to conserve potable (drinking) water by substituting it with rainwater. WSUD strategies allow you to achieve the following outcomes and helps Melbourne transition to a water sensitive city:

- improve water quality in streams and in groundwater
- protect stream and riparian habitats for native plants and animals
- prevent erosion of banks along our waterways
- reduce flooding risk
- protect the scenic and recreational values of streams
- conserve potable water by providing an alternative water source for uses such as, irrigation and toilet flushing.

How does my choice of Stormwater Management strategies impact on the environment?

There is enormous scope for creativity when building or renovating to incorporate a variety of WSUD strategies into your design.

Some simple measures to eliminate the negative impacts of stormwater and conserve potable water are outlined below:

Measure	Stormwater Quality	Stormwater Quantity	Potable Water Substitution
Rainwater tanks	Highly Applicable	Highly Applicable	Highly Applicable
Raingardens & swales	Highly Applicable	Highly Applicable	Moderately Applicable
Porous pavers	Moderately Applicable	Moderately Applicable	Not Applicable
Drought tolerant landscaping	Not Applicable	Not Applicable	Highly Applicable

Rainwater tanks



Rainwater tanks are perhaps the easiest way to reduce the amount of stormwater leaving your property. They also have the added benefit of providing a water source that can replace drinking (potable) water in certain uses such as outdoor use, toilet flushing and clothes washing. By using stormwater to replace drinking water, savings of up to 90% can be achieved.

Tanks come in many different colours, materials and designs. They can be installed above ground, under ground, below outdoor decks, under buildings (if space allows), or even hidden within planter boxes.

Sizing rainwater tanks is contingent on a number of variables namely, rainfall, roof catchment area and proposed uses. There are now a number of free tools, such as Tankulator and STORM, available to assist people in sizing their tanks and delivering best practice WSUD outcomes. For more information on water tanks, see the resources section of this fact sheet and refer to fact sheet 3.0 Water Efficiency.



Some basic guidelines to best practice Stormwater Management

Porous paving

Porous paving allows rainwater to pass through the pavers and soak into the ground, unlike standard concrete or block pavers. By using porous pavers you can:

- reduce the amount of 'impervious' surfaces on your block
- increase groundwater recharge by allowing the water to soak through the soil
- improve stormwater quality by filtering stormwater and reducing pollutant loads
- reduce high flows during peak rain events entering the waterway from urban areas causing stream erosion and habitat scouring.

Porous paving is installed in the same way as traditional paving and is available in many forms. They can be used to replace asphalt, concrete or other impervious pavers.



Porous paving will allow for drainage in urban areas.

Drought tolerant landscaping

The average Victorian family uses almost twenty percent of their drinking water in the garden. You can not only reduce your water consumption by reusing household water or rainwater, but also by maintaining a water-efficient garden. This can be done through simple measures, such as using mulch, maintaining healthy soil or installing a more efficient watering system.

Drought tolerant plants are also an excellent way to save water in the garden. They are better suited to our dry environment and create an attractive and low-maintenance garden.

Raingardens

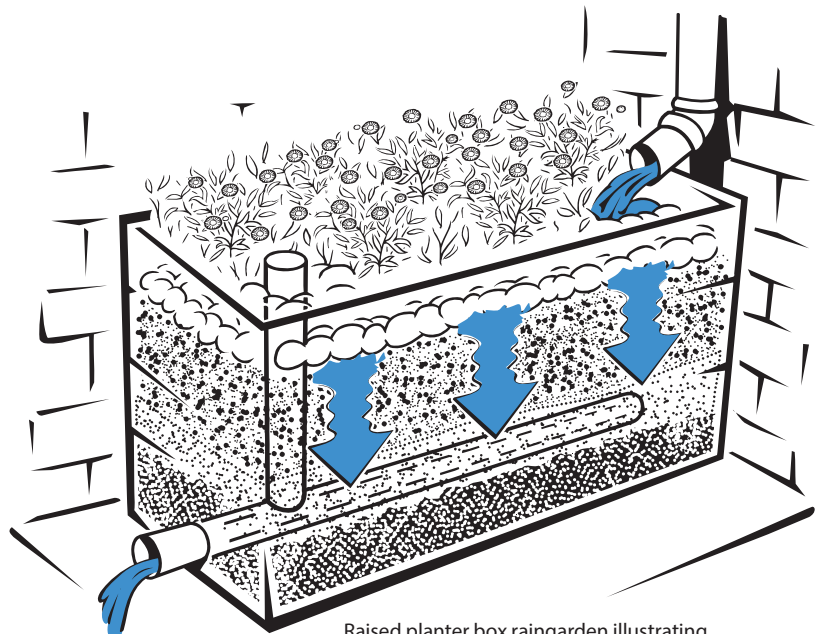
Installing a raingarden on your property is an easy way to reduce pollutant loads in stormwater while providing attractive landscaping. Raingardens are designed to capture, filter and reduce the flow rate of stormwater from roofs or hard surfaces.

For more information on raingardens, see the resources section of this fact sheet.

“ Generally, the size of the raingarden should be approximately two percent of the run-off area. One square meter of raingarden commonly treats 50 square meters of hard surface. ”

Raingarden sizing chart

Area of run-off (m ²)	Raingarden size (m ²)
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9



Raised planter box raingarden illustrating waterflow and filtration.

Some basic guidelines to best practice Stormwater Management



Measuring Stormwater Management performance

To address and measure stormwater quality outcomes, the Best Practice Environmental Guidelines (BPEG) were developed and published by the Victorian Stormwater Committee. These guidelines establish specific stormwater quality objectives, to assist in determining the level of stormwater management necessary to meet the State Environment Protection Policy (SEPP) requirements. These guidelines are now a referenced document in the State Planning Policy Framework. The best practice performance objectives from the BPEG aim to remove:

- 80% of suspended solids
- 45% of total Nitrogen
- 45% of total Phosphorus
- 70% of typical urban annual litter load.

When applying for a planning permit, you may be required to demonstrate that your development proposal will meet these performance targets. This can be done through the use of different tools.

For small and medium sized developments, Melbourne Water developed STORM, a free and simple online stormwater calculator that helps you assess and improve your design's stormwater performance. Exceeding the 100% benchmark in the STORM tool confirms that your building design will meet Council's performance targets.

For large sized developments, we recommend using proprietary tools such as MUSIC and Urban Developer to simulate urban stormwater systems and their performance. These tools require a sound knowledge of urban stormwater management principles and practices.

Where can I find out more?

STORM calculator
Melbourne Water
www.storm.melbournewater.com.au

Tankulator
Alternative Technology Association
www.tankulator.ata.org.au

Raingardens
Melbourne Water
www.raingardens.melbournewater.com.au

General stormwater information
Melbourne Water
www.melbournewater.com.au

Stormwater Management Education Programs
Clearwater
www.clearwater.asn.au

Information about Victoria's water environments
Environmental Protection Authority
Victoria
www.epa.vic.gov.au

Information about water and wastewater services
Water Services Association of Australia
www.wsaa.asn.au

WSUD Guidelines
Refer to individual Council websites

Other Fact Sheets in this series are also available to provide guidance on the 10 Key Sustainable Building Categories. For further information on Stormwater Management, consider the Fact Sheets entitled:

- Water Efficiency
- Urban Ecology
- Site Permeability

Mandatory Requirements and Council's Best Practice Standards

Mandatory Requirements

You must meet:

The National Construction Code (NCC) requirements for water efficiency.

New developments may be required to install a rainwater tank. For a single dwelling, a rainwater tank must:

- have a storage capacity of at least 2,000 litres
- be connected to a roof catchment of at least 50 square meters
- be connected to all internal toilets.

Meet the objectives and standards of the local planning scheme including permeability, site coverage, stormwater management and water sensitive urban design (as applicable).

Council's Best Practice Standards

- Exceed Victoria's best practice stormwater performance targets, set out in the Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG) and local integrated water management plans. These targets may be demonstrated by a STORM rating of at least 100% or equivalent modelling results (MUSIC, Urban Developer).
- Note: rainwater tanks sized for retention are in addition to any required for detention in storm events.

Developments, which seek to vary from these best practice standards, must demonstrate how best practice stormwater management can be satisfactorily achieved.