INSTRUCTION SHEET

Building a swale

healthy waterways
Raingardens

What is a swale?

Building a swale is a simple way to help the environment and the health of our local waterways.

A swale is a small channel that conveys water from one point to another. When planted with grasses or native vegetation, swales can be positioned to collect stormwater from driveways and other hard surfaces such as roofs.

Swales help to reduce the amount of stormwater entering our rivers and creeks.

Too much stormwater entering our waterways can lead to erosion of river beds and banks, and provide unfavourable conditions for many plant and animal species.

Please note: A certified plumber must be used for stormwater connections and modifications.

Did you know that you can even use a swale to convey stormwater to a raingarden built elsewhere in your backyard?

State Government Victoria

Melbourne Water

Looking after your swale

Once established, swales are very low maintenance especially when planted with native plant species. They don't need to be watered or fertilised. However, a few simple tips can help your swale mature and function well.

- Some weeding may need to take place until plants have matured.
- Evenly distribute water flow into the swale to limit erosion from heavy rainfall. Strategically placed rocks may help with this. Alternatively a flow spreader can be attached to the end of the downpipe.
- Inspect your swale regularly – replace plants and repair erosion when necessary.
- Check that the swale is operating as you intend by ensuring that the water is draining away, checking the downpipe and overflow for blockages.

Materials List – what you need to build your swale

The following table details the materials required to create a $2m^2$ long swale. While item prices may vary depending on the materials you select, building a $2m^2$ swale is likely to cost between $150 and $200 (plus the cost of a plumber).

QUANTITY	MATERIAL
$0.3m^3$	Topsoil
12	Plants (150mm pots)
$0.05m^3$	20mm Fine Crushed Rock
$1m^2$	Large flat rocks (100-200mm diameter)
$0.1m^3$	Gravel mulch
$1m^2$	PVC liner (under rockwork near downpipe) or geotextile (optional)
10	100 – 300mm diameter rocks (optional)
1	90mm diameter uPVC 90 degree bend or 2x 45 degree bends
1	90mm diameter uPVC grated end cap
1 l/m	90mm diameter uPVC pipe*

l/m = lineal metres m^2 = square metres m^3 = cubic metres mm = millimetres
** Length subject to change based on location of existing stormwater pipe.*

Plant List – the best plants for your swale

The following plants will grow well in swales in and around greater Melbourne.

BOTANICAL NAME	COMMON NAME	CONDITIONS	SIZE (H x W) (cm)
Anigozanthos species	Kangaroo Paw	Full sun	30-90 x 100-120
Blechnum nudum	Fishbone Water-fern	Full sun to partial shade	50-100 x 40-80
Calocephalus lacteus	Milky Beauty-Heads	Full sun to partial shade	15-30 x 10-30
Carex appressa	Tall Sedge	Full sun to partial shade	80-100 x 120
Carpobrotus modestus	Pigface	Full sun	20cm high and spreading
Chrysocephalum apiculatum	Common Everlasting	Full sun	30-90 x 10-30
Derwentia perfoliata	Digger's Speedwell	Full sun to partial shade	20-40 x 30-60
Dianella species	–	Full sun to partial shade	60-120 x 40-150
Ficinia nodosa	Knobby Club-Rush	Full sun	50-150 x 60-200
Juncas amabilis	Hollow Rush	Full sun to partial shade	20-120 x 20-50
Juncas flavidus	Yellow Rush	Full sun to partial shade	40-120 x 20-100
Leucaphyta brownii	Cushion Bush	Full sun, salt tolerant	100 x 200
Lomandra species	–	Full sun to partial shade	60-120 x 50-100
Melaleuca ericifolia	Swamp Paperback	Full sun to partial shade	4m high x 3m wide
Myoporum parvifolium	Creeping Boobialla	Full sun	20-30 x 300
Patersonia occidentalis	Native Iris	Sun to partial shade	20-40 x 30-60
Pratia perdunculata	Matter Pratia	Partial shade	50-150 x 1.8-5
Wahlenbergia communis	Tufted Bluebell	Full sun	15-50 x 15

Building your swale

Step 1 – getting started

Location

A swale can be built where there are existing earth areas (i.e. grass or a garden bed). The start of the swale should be located under the downpipe that you plan to divert.

Note – see Melbourne Water's Downpipe Diversion Instruction Sheet for further information melbournewater.com.au.raingardens

Provided the swale slopes away from the downpipe, it can even be built to meander through your backyard.

Stormwater diversion

To ensure that the area is not flooded during construction, your local plumber should determine how and when to divert the downpipe. A temporary diversion may be required. Your plumber will also be able to determine the depth and location of the stormwater outlet for the overflow.

You may also consider building a swale to carry stormwater from the diverted downpipe to a stormwater surface pit located on your property. Before commencing any works, you should consider where this is located.

All connections from and into the existing stormwater pipes need to be done by a licensed plumber.

Underground services

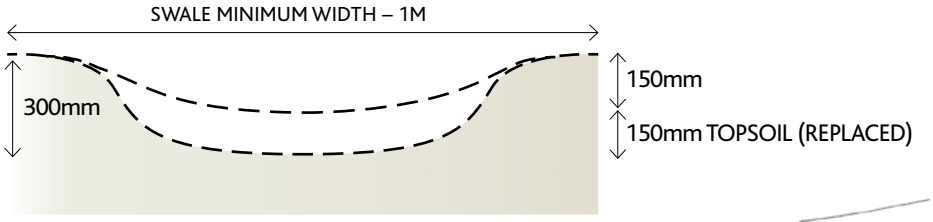
Be aware of any underground services (gas, electricity, water) that run near your house or under your garden as this will determine where you can excavate. Swales should not be built over or in close proximity to a septic system.

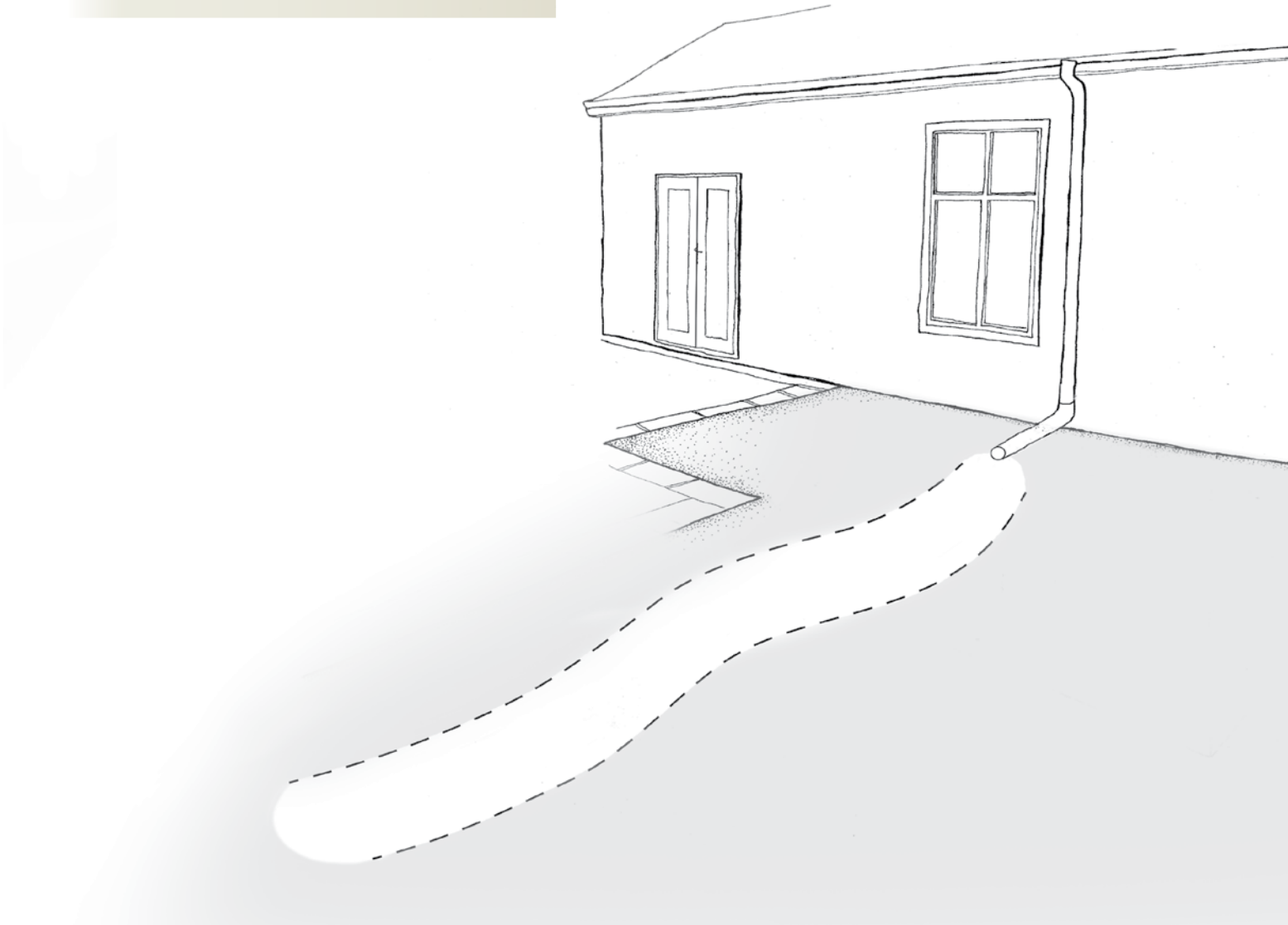
Materials

See *Materials List* for information about what you need to build a swale.

Size

You need to determine a shape for the swale that best suits your garden. The dimensions of a swale should be approximately 1m wide x 150mm deep, shaped in a trapezoidal or triangle formation. A swale can be any length provided you can maintain a slope away from the downpipe without the swale becoming too deep.





Step 2 – excavation

› Once you have determined the location and shape of the swale. Locate the existing stormwater outlet, determine its depth and excavate a 200mm wide trench from the existing stormwater drain to the nominated overflow point (i.e. at the end of the swale).

› Strip the first 150mm of topsoil from the area and put it aside to be reused later.

› Excavate a further 150mm. This will allow for topsoil replacement later in the process.

› Unless the swale is discharging to an existing stormwater surface pit, an inground raingarden or infiltration raingarden, it will need to be fitted with an overflow pipe connected back into the stormwater system. While you will need to engage a plumber to manage the connection work, the general steps are as follows:

› Once the trench is prepared, your plumber will connect the overflow pipe back into the stormwater drain.

› The top of the overflow should be set at the end of the swale, 50mm above the gravel mulch and covered with a grated cap to ensure debris does not enter the stormwater system.

Remember – all connections from and into the existing stormwater pipes need to be done by a licensed plumber.

Optional step

You may want to feature rockwork along the edges of the swale. This should be done prior to replacing the topsoil. Ensure that the rocks are embedded into the ground to prevent erosion underneath.

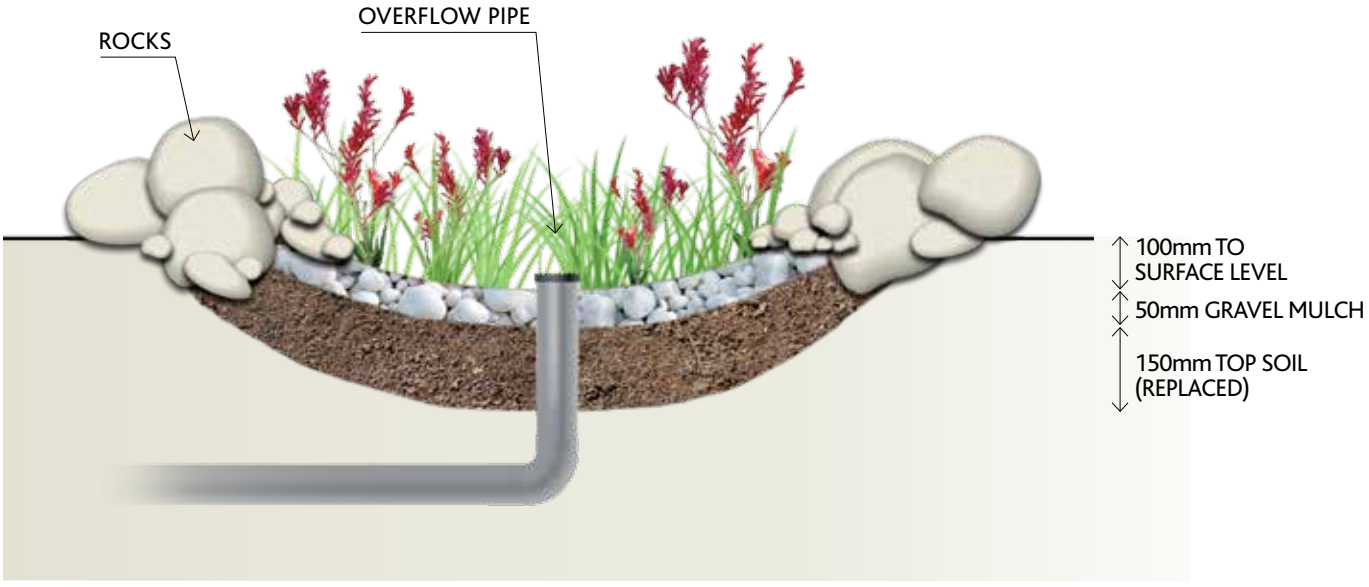
Step 3 – soil and rock work

› Add 150mm of topsoil into the excavated swale ensuring that the topsoil is formed into the final swale shape.

› Place some large, flat, angular rocks where the water from the downpipe will discharge into the swale. Place smaller rocks in between the large rocks to fill any gaps. This will create an interlock between the large and small rocks. It is very important to fill any gaps in the rockwork to avoid erosion. Alternatively, a flow spreading device can be fitted to the downpipe.

› If you wish, you may add a PVC liner or geotextile fabric underneath the rockwork for added protection.

Did you know the legal point of discharge is the point at which your property discharges to stormwater? This point is specified by council and should not be altered without council approval.



Step 4 – pipe adjustments, plants and mulch

Pipe adjustments

Your plumber will redirect the downpipe into the trench using pipe bends where required.Two 45 degree pipes connected together will provide a much gentler and more even flow of water and reduce the risk of erosion. A 90 degree bend pipe will do as an alternative.

Plants and mulch

In general, plants that grow well in a swale –

- like dry conditions but can tolerate temporary wet periods
- are perennial rather than annual
- have an extensive fibrous root system.

A wide range of plants are suitable for swales and your local nursery will be able to guide you on what is right for your area. There are also particular plants that are really good at removing pollutants from stormwater. These include –

- *Carex appressa*
- *Lomandra longifolia*
- *Juncus flavidus*
- *Melaleuca ericifolia*
- *Goodenia ovata*

50% of your swale should be planted with these species, the other 50% can be made up of plants that like a dry environment with intermittent wet periods. It is important that the plants you select are suitable for the amount of sun and shade on your swale. See the *Plant List* for information about suitable swale plants.

Regardless of the type of plants you select, it is important to plant the swale densely. As a guide, you will need six plants per m² of swale. So if your swale is 2m long, you will need 12 plants.

Set the plants at roughly 6 plants per m², and plant into the topsoil. Spread gravel mulch to a depth of 50mm. Water the plants in – complying with your local water restrictions – to complete the installation process.

Need help?
If you have questions about building a swale, your landscape gardener or local plumber may be able to help. For more information visit melbournewater.com.au/raingardens

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ISBN 978-1-921603-93-8 (print)

ISBN 978-1-921603-94-5 (web)

Version 5, December 2013

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