INSTRUCTION SHEET

Building a swale

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?

Cooks River ALLIANCE

The Cooks River Alliance is a partnership between Bayside Council, City of Canterbury-Bankstown Council, City of Sydney Council, Inner West Council and Strathfield Council.

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 the Downpipe Diversion Instruction Sheet for further information

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

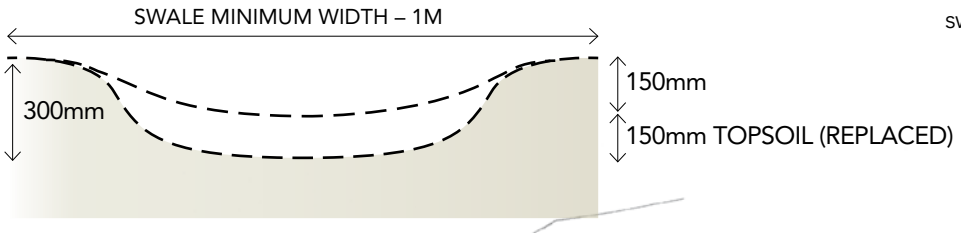
Be aware of any underground services (gas, electricity, water) that run near your house or under your garden as this will determine where you can excavate. Swales should not be built over or in close proximity to a septic system.

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.

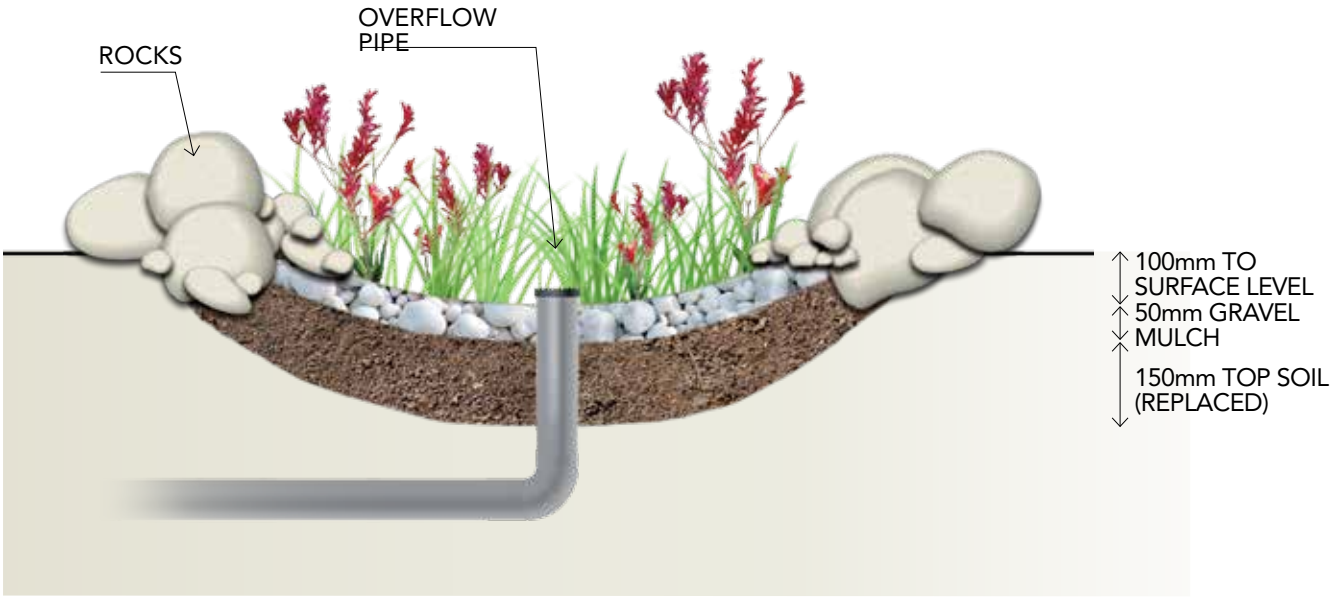
Optional step

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.

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 2m² long swale.

QUANTITY	MATERIAL
0.3m³	Topsoil
12	Plants (150mm pots)
0.05m³	20mm Fine Crushed Rock
1m²	Large flat rocks (100-200mm diameter)
0.1m³	Gravel mulch
1m²	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 m² = square metres m³ = cubic metres mm = millimetres
* Length subject to change based on location of existing stormwater pipe.

Plant List – suitable plants for your swale

	GENUS	SPECIES	COMMON NAME
Grasses:	Austrostipa	ramosissima	Stout Bamboo Grass
	Entolasia	marginata	Wiry Panic Grass
	Hemarthria	uncinata	Carpet Grass
	Microlaena	stipoides	Weeping Grass
Small Plants (< 50cm tall):	Arthropodium	fimbriatum	Chocolate Lily
	Arthropodium	milleflorum	Vanilla Lily
	Hypoxis	hygrometrica	Golden Weather-grass
	Laxmannia	gracilis	Slender Wire Lily
Small Plants (50 - 100 cm tall):	Dianella	caerulea	Paroo Lily
	Gahnia	aspera	Saw Sedge
	Lepidosperma	laterale	Sword Sedge
	Lomandra	filiformis	Mat Rush
Groundcovers:	Centella	asiatica	Swamp Pennywort
	Dichondra	repens	Kidney Weed
	Geranium	homeanum	Native Geranium
	Veronica	plebeia	Trailing Speedwell
Semi Aquatic - Aquatic and Saltmarsh Species:	Carex	appressa	Tussock Sedge
	Ficinia	nodosa	Nobby Rush
	Juncus	krausii	Sea Rush

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