HOW TO BUILD A VEGETABLE RAINGARDEN

WHAT IS A VEGETABLE RAINGARDEN?

A vegetable raingarden is a special garden bed designed to receive and filter stormwater run-off from roofs while being used to grow vegetables. When built in a planter box, a vegetable raingarden can be positioned to collect roof water from a diverted downpipe. Building a raingarden is a simple way to help the environment and to improve the health of our local waterways. It also provides a self-watering garden for your backyard.

While a traditional raingarden receives stormwater run-off on the surface, a vegetable raingarden has the water entering at the base of the raingarden. This helps to prevent the vegetables being submerged after heavy rain and allows water to be used more efficiently as there is less evaporation from the soil surface.

Because it has layers of soil and sand for filtration and gravel for drainage, a vegetable raingarden helps to protect our rivers and creeks from stormwater pollutants and intense flows that can cause erosion.

PLEASE NOTE: A CERTIFIED PLUMBER MUST BE USED FOR STORMWATER CONNECTIONS AND MODIFICATIONS.

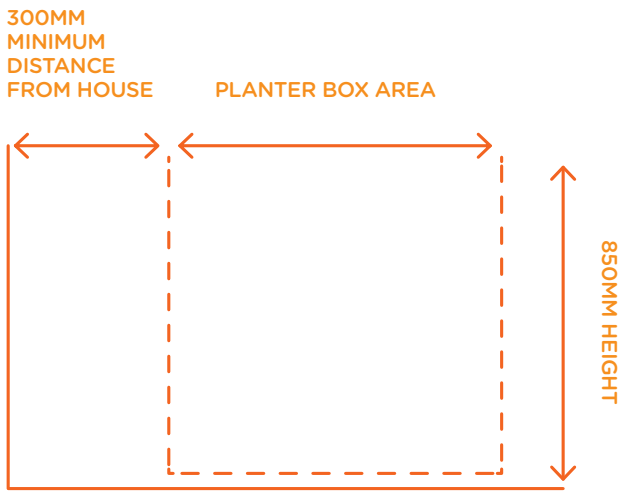
DID YOU KNOW?

A normal raingarden is only wet during and immediately after rain, leaving it dry most of the time. A vegetable raingarden is designed to use water more efficiently, however it is likely your raingarden will require some watering during dry periods.

RAINGARDEN SIZING CHART*

You need to make sure your raingarden is large enough to manage the amount of stormwater it will receive. If your raingarden is going to capture run-off from the roof via a downpipe, measure the roof area that drains to that downpipe. Generally, the size of the raingarden should be no less than 2% of the run-off area. But do not make the raingarden too large (>10%), as this may lead to "dry" zones in the vegetable raingarden which are not suitable for growing vegetables. The table below will help you work out the correct size for your raingarden.

AREA OF RUN-OFF (M^2)	RAINGARDEN SIZE MINIMUM (M^2)
50	1
100	2
150	3
200	4
250	5
300	6
350	7
400	8
450	9



MATERIALS

Below is a list of the materials required to build a $2m^2$ vegetable raingarden:

MATERIAL	QUANTITY
90mm diameter slotted Ag pipe	2l/m
90mm diameter uPVC pipe	2l/m**
Geotextile fabric	$2m^2$
Wicks – any cloth; approximately 600mm long	3
Gravel (20mm scoria)	$0.4m^3$
Sand (white-washed)	$0.2m^3$
Vegetable garden mix	$0.6m^3$
Vegetable plants – as seedlings	4 - 15
Mulch (e.g. pea straw)	$0.1m^3$
90mm diameter uPVC 90 degree (elbow) bends	3
PVC 90mm tee	1
PVC 90mm cap	1
PVC liner (if planter box is lined)	$10m^2$
PVC tape	
Silicone sealant	

* Please note raingarden size minimums. A vegetable raingarden can be built larger than these recommended minimums, however your raingarden should be no larger than 10% of the run-off area.

** Number of linear metres required depends on length of connection back to existing stormwater drain.

- l/m = linear metre
- m2 = square metres
- m3 = cubic metres
- mm = millimetres

LIST OF BEST VEGETABLES FOR YOUR RAINGARDEN

NAME	PLANTING SEASON	SPACE AROUND EACH PLANT (CM2)
Onion	Autumn/Winter	10
Leek	Winter/Spring/Summer	15
Beetroot	Winter/Spring/Summer	10
Capsicum	Spring/Summer	50
Cucumber	Spring/Summer	100
Lettuce	All seasons	30
Basil	Spring/Summer	20
Parsley	Winter/Spring/Summer	30
Common bean	Spring/Summer	15
Tomato	Spring/Summer	60
Spinach		20
Broad bean	Autumn	20

NEED HELP?

If you have any questions about rainwater tank diversions, downpipe diversion or building a raingarden, your landscape gardener or local plumber may be able to help.

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STEP ONE

GETTING STARTED

LOCATION

Build your vegetable raingarden as close as possible to a source of stormwater such as a downpipe. This will help minimise the additional plumbing needed to bring water to the raingarden. The raingarden needs to sit at least 300mm away from any permanent structure (e.g. a building). Any raingarden built within 5 metres from a permanent structure should be PVC lined to prevent the infiltration of water into the surrounding soils and building footings. Remember that a vegetable raingarden should also be positioned to receive as much direct sunlight as possible.

Having decided on a location, it is important to determine the proximity of the existing stormwater, as the raingarden overflow pipe will need to be connected to it. Your local plumber can help with this process as well as diverting the downpipe.

STORMWATER RECONNECTION

All connections or modifications to existing stormwater need to be done by a licensed plumber. Your plumber will ensure that the stormwater is reconnected correctly and not connected to another service such as the sewer.

UNDERGROUND SERVICES

Be aware of any underground services (gas, electricity, water) that runnear your house as this may determine where you can build your vegetable raingarden.
A raingarden should not be built over or close to a septic system.

STEP TWO

PLANTER BOX AND PIPES

PREPARING YOUR PLANTER BOX

You can create a vegetable planter box out of any material as long as it is watertight and strong enough to hold saturated soil. This could be a corrugated iron 'tank' or you could build your own planter box using hardwood or similar. If the raingarden is located within 5 metres of a permanent structure, the sides and base will require a PVC liner. Overlap the sheets by 200mm and seal the joins with PVC tape.

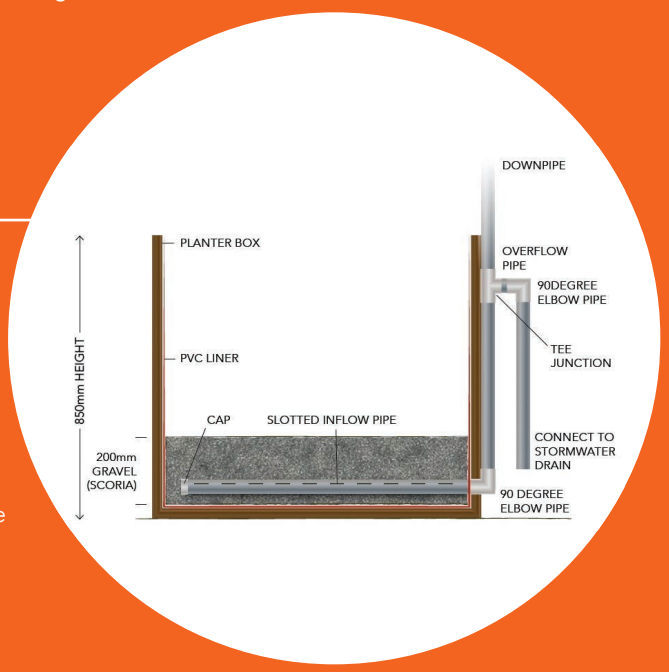
Place the gravel (needs to be 20mm in size) to a depth of 50mm. This will form a base for the slotted drainage pipe. Make sure the gravel is washed and free of excess dirt as this can create blockages in the inflow pipe (where water feeds the vegetable raingarden).

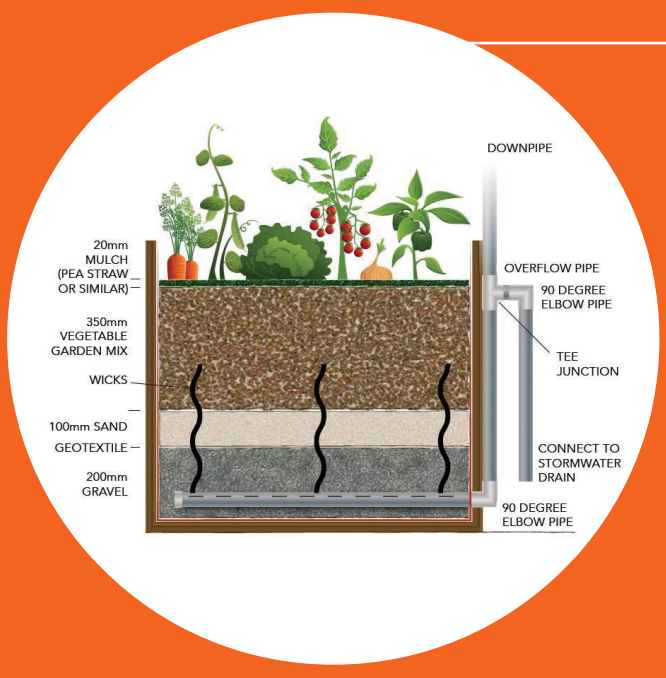
PLUMBING – TO BE COMPLETED BY A LICENSED PLUMBER

Cut a section of 90mm diameter slotted drainage pipe. The drainage pipe's length needs to be slightly shorter than the (internal) length of the planter box. Lay the section of pipe horizontally along the centre of the planter box base - on top of the 50mm layer of gravel. Place a cap on one end of the (internal) pipe. Your plumber will glue all plumbing pieces securely together.

Make a 90mm diameter hole in the middle of one side of the planter box - 50mm from the base. Push the cap-free end of the inflow pipe through the hole, leaving the rest of the pipe lying across the middle of the planter box. You will need to fill gaps between the outside of the drainage pipe and the hole in the planter box with sealant. The cap-free end of the drainage pipe needs to be connected to the downpipe using additional pipe and pipe bends. The plumbing also needs to incorporate an overflow to pipe excess water back into the stormwater system.

The overflow for a vegetable raingarden is external to the planter box. This helps limit contamination of any overflowing water going into stormwater. Excess nutrients from the vegetable mix need to be kept away from stormwater as nutrients in waterways can lead to algal blooms and weed growth. To construct the overflow, connect a section of 90mm diameter PVC pipe to the downpipe using a tee junction. The overflow pipe outside the planter box should be level with the soil surface of the finished planter box (or about 200mm from the top of the planter box). The overflow pipe then needs to be connected into the stormwater by your plumber.





STEP FOUR

PLANTS AND MULCH

VEGETABLES

A range of vegetables can be grown including tomatoes, beans, lettuce, spinach, cucumber, beetroot, onions and leeks. Herbs also grow well. While vegetables can be planted as either seeds or seedlings, seedlings generally need less hand watering to become established. Allow enough space between your vegetables to prevent overcrowding.

Note: fertilisers and chemical pesticides must not be used on your raingarden as the nutrients in these compounds can have a harmful effect on our waterways.

MULCH

Spread mulch to a depth of 20mm around the plants. Pea straw or sugar cane mulch are ideal for a vegetable raingarden, as they provide nutrients for the plants.

Once established, a vegetable raingarden is low maintenance, however a few simple tips can help your raingarden function well:

- Your raingarden will likely need some watering in the summer months, during hot and dry periods.
- Do not water your raingarden excessively and avoid watering immediately before or after rainfall.
- Avoid using fertilisers and pesticides. Apply small amounts only if necessary and ensure the overflow has been set up to avoid stormwater pollution, see 'Plumbing' section.
- Top up the vegetable garden mix layer as necessary.
- Ensure that the overflow pipe does not become blocked.

STEP THREE

SOIL LAYERS

GRAVEL LAYER

Add gravel to a depth of 150mm over the slotted drainage pipe to bring the total depth of gravel to 200mm. Take care not to dislodge or damage the pipe when adding the additional gravel.

SAND LAYER AND WICKS

Place a layer of geotextile fabric on top of the gravel and then place white washed sand to a depth of 100mm. The geotextile will prevent the sand from settling downwards and will act as a horizontal "wick" to move water to all corners of the vegetable raingarden. Using vertical wicks is also recommended to help with the upward movement of water in the raingarden. This will help the plants get water that would otherwise stay below the sand layer.

You can use any kind of cloth as a wick, including old clothing and/or any leftover geotextile. The cloth should be rolled into a cylinder and be long enough to span at least half the height of the raingarden (i.e. about 500-700mm). Place the bottom end of the vertical wick in the gravel layer as deep as possible. Infill the sand and then the vegetable garden mix around the wick. Keep the wick vertical so that the top of the wick is well into the vegetable garden mix layer. Two to three wicks should be sufficient for a $2m^2$ vegetable raingarden.

VEGETABLE GARDEN MIX LAYER

Add vegetable garden mix to a depth of 350mm or to the height of the downpipe overflow connection. This is a blend of composted green waste and animal manures with sand added for drainage, and is available from garden suppliers.

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Images & concept supplied courtesy of Melbourne Water. A Protecting Our Waterways resource for Penrith City Council.

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