

New Driveway

Alternative options for driveway treatment

Acknowledgement – the information in this fact sheet has been adapted from the practice notes prepared by Storm Consulting for the Little Stringy Bark Creek Project. For more information on this project please visit the project website - <u>http://www.urbanstreams.unimelb.edu.au/</u>

What treatment options are there?

Through good design, there are many ways to minimise, offset or treat stormwater runoff from your new driveway or paved area.

Ribbon Driveway

If you are thinking of constructing a new concrete driveway, consider designing it in the "ribbon" style. This type of driveway has a grassed or permeable strip down the centre (see right). Runoff from the concrete area flows onto the grass and infiltrates into the soil. This keeps the stormwater on site and stops it from entering the creek.

It is important to make sure the driveway is constructed so that water will run into the centre grass strip, or a grassed area next to the driveway (see Shedding to Pervious Areas below). When designing the driveway, it is very important to ensure that the area of grass is at least as large as that of the driveway. For example, if your new driveway is going to be 20m², then you need to direct the water to infiltrate over a grassed area of 20m².

With ribbon driveways, it is important to ensure that the grassed area is at least 25mm below the concrete area, to allow the water to flow onto the grassed area and infiltrate (see Figure 1 below). These driveways are easy to maintain - just use a lawn mower to keep the grass at your preferred height. Also, because it is being passively watered, it won't need any additional watering. A ribbon driveway is suitable for most driveway applications, no matter the size or soil type. However, for steep driveways, it is best to consider another treatment option.



Figure 1. Driveway cross-section





Permeable Paving

Paving that allows water to flow through the paver, and infiltrate into the soil, is called 'permeable paving'. It is also known as 'porous paving' or 'pervious paving'. Permeable paving is an excellent stormwater management tool, as it reduces runoff. By increasing infiltration and reducing runoff, it helps to restore and mimic the natural water cycle and reduce the effects of urbanisation. In areas with clay soils, the pavers can be laid on a base of sand, with an optional sub-base of crushed aggregate. This increases the infiltration and detention capacity of the paved area.



Figure 3. A permeable paver, with water freely draining through it. Image source:Hydrocon,2011



Furthermore, using permeable pavers instead of traditional pavers reduces flooding and ponding, recharges aquifers and groundwater and provides onsite water retention. Permeable paving allows adequate space for tree roots to grow into well watered spaces, promoting a greener, healthier urban environment.

Permeable paving can be applied in place of almost any hard ground surface, such as footpaths, driveways, patios, and pool edges. Please note, permeable pavers are not suitable for use on slopes greater than 8%. There are many permeable paving products on the market, which look just like regular paving. You can also use permeable pavers as an edge strip, border or centre strip. Permeable pavers require little more maintenance than regular pavers or concrete. Simply scrub down with a hard bristled brush, or use a high pressure hose to release dirt and particles. The base and sub-base will need to be replaced every 10-20 years or so.





Figure5. Permeable pavers can be used for driveways and are fully trafficable. Image source: Permapave, 2011(left)





Passive Irrigation

One of the simplest options to manage runoff from your new or existing driveway or paved area is to direct or divert this water to a lawn or garden. By grading your driveway to fall towards your lawn or adjacent garden bed, water which runs off the surface will infiltrate into your garden and not enter the stormwater system. This helps retain water on your property, and also provides the added benefit of passively watering your lawn or garden for you!

Sizing these treatment systems is very simple: you need an equivalent amount of pervious area to treat the impervious area. For example, if your new patio is going to be $25m^2$, then you need $25m^2$ of lawn or garden for passive irrigation. Such designs can only work effectively on slopes less than 4%.

The most important thing is to ensure that all the water from your driveway diverts to a pervious area, and does not enter the stormwater system.

Raingarden or Infiltration trench

If you do not have enough space for passive irrigation, then diverting your driveway to a raingarden or infiltration trench is a good idea. These systems provide significant treatment within a small area. Water can be collected in a shallow culvert or drain at one end of your driveway, and drain via pipe to a raingarden or infiltration trench nearby.

An infiltration trench is a gravel filled trench below the ground surface, which is design to receive, treat and store stormwater runoff (see below). More information how infiltration trenches work, their sizing and construction, can be found in the Infiltration Trench Practice Note.

Raingardens look just like regular garden beds, but have specific layers of soil for filtration and drainage. They are designed to treat stormwater and increase infiltration of water into the soil. They are planted with a variety of plants that tolerate both extreme wet and dry conditions.

The infiltration raingarden practice note has more details on how to size your garden, where to put it, how to build it, and which plants to use. See "Further information" below for links to other practice notes.



Figure 6. Infiltration trench (left), established raingarden (right)





Sizing

The table below provides guidance of the area of raingarden, or length of infiltration trench required to treat an impervious area to meet the standards. For example, if you wanted to treat a new driveway and courtyard, totalling 100m², then a raingarden of 4m² would be required to meet the standards. Alternatively, a 10m long infiltration trench could also be used instead. Please not that either a raingarden, or infiltration trench is required, not both.

Impervious Area (m²)	Raingarden area (m²)	Infiltration trench length (m)
10	1	1
50	2	5
100	4	10
150	5	20
200	5	25
250	6	35
300	7	40
350	9	45
400	11	50
450	13	55

Table1. Sizing table for raingardens and infiltration trenches

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

