

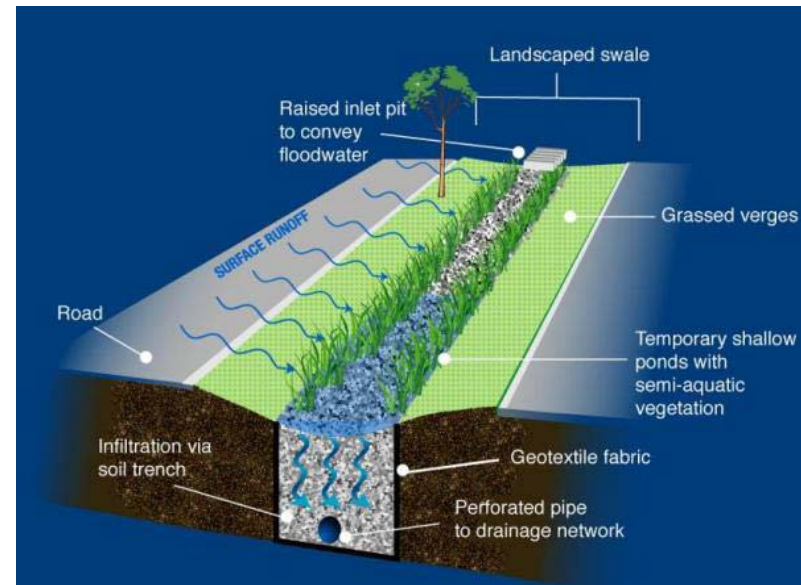
## Bio-filter swale design principles

Using vegetated strips to treat stormwater

### What is a swale?

A typical bio-retention swale consists of:

- Top layer - Vegetated swale or basin to hold water
- Middle layer - filter media (specified sand base)
- Bottom layer - drainage pipe with connection to drainage system
- Swales should also contain an overflow or inlet for flood events



Source: Facility for Advancing Water Biofiltration 2008

### Good design elements



Calculated detention area/basin – will slow/capture water in a rain event and filter

Rocks good for scour protection and coarse sediment removal at inlets

Formalised pedestrian crossing



Calculated slope planted with vegetation (grassed)

### Swales as buffer or grassed strips

Swales can also be grassed depressions or buffer strips that do not have filter media or pipes. These are more typical in a rural setting and be more effective treatment measure than traditional curb and channel, particularly where there is no connection to the drainage system.

### Things to watch out for...

Tip – the swale needs to be assessed as being an appropriate treatment for the location and sized in accordance with modelled run off from the area it is treating/capturing. Swales also require regular maintenance.



Calculating the right amount of detention area

Getting the slope right i.e. not too shallow or too steep

### For technical guidance refer to

- FAWBs Guidelines for designing the correct detention area and slope incline - <http://www.clearwater.asn.au/content/facility-advancing-water-biofiltration-fawb-guidelines-version-301>
- Maintenance guide from the Auckland Council in NZ - <http://www.clearwater.asn.au/content/operation-and-maintenance-guide-swales-and-filter-strips>
- Infrastructure Design Manual – Stormwater Treatment Section 20 <http://www.designmanual.com.au/>

### Swales in residential developments

Some Councils are no longer recommending the use of bio-filtration swales in a residential setting. Residents have misunderstood the purpose and made unwanted and detrimental modifications to the swale e.g. filling with rocks and/or top soil. If swales are to be successful in residential area a public awareness program should be in place.