

Chapter 5 **Bioretention swales**



Bioretention swale in Zetland, NSW

5.1 Introduction

Bioretention swales provide both **stormwater** treatment and conveyance functions. A bioretention system is installed in the base of a **swale** that is designed to convey minor floods. The swale component provides pretreatment of stormwater to remove coarse to medium sediments while the bioretention system removes finer particulates and associated contaminants. Figure 5.1 shows the layout of a bioretention swale.

A bioretention system can be installed in part of a swale, or along the full length of a swale, depending on treatment requirements. Typically, these systems should be installed with slopes of between 1% and 4 %. In steeper areas, **check dams** are required to reduce flow velocities. For milder slopes, adequate drainage needs to be provided to avoid nuisance ponding (a bioretention system along a full length of the swale will provide this drainage).

Runoff can be directed into bioretention swales either through direct surface runoff (e.g. with flush kerbs) or from an outlet of a pipe system. In either case traffic needs to be kept away from the filter media as compaction can change the filter media functions substantially.

To design the bioretention swale, separate calculations are performed to design the swale and the bioretention system, with iterations to ensure appropriate criteria are met in each section. Depending on the length of the swale and steepness of the terrain, check dams can be used to manage steep slopes and also to provide ponding over a bioretention surface. In this way increased volumes of runoff can be treated through a bioretention system prior to bypass.