

VERSION 1.0

## Stormwater Solutions for Residential Sites

### *Section 8 – Swales*

*Prepared for*

#### **EcoWater Solutions**

A Department of Waitakere City Council  
113 Central Park Drive  
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WAITAKERE CITY  
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### 8.1 Description

Swales can assist in preserving a site's predevelopment runoff characteristics by retarding flow and providing some infiltration especially from larger areas of impervious surface like driveways and carpark areas. Swales also provide treatment of stormwater.

A bioretention trench is similar to a swale on the surface, but includes a low flow trench underneath the grassed surface that is filled with filter material. Runoff from driveways and carpark areas can be discharged directly to this filter media. Reference should be made to ARC TP10 publication for details on bioretention trenches.

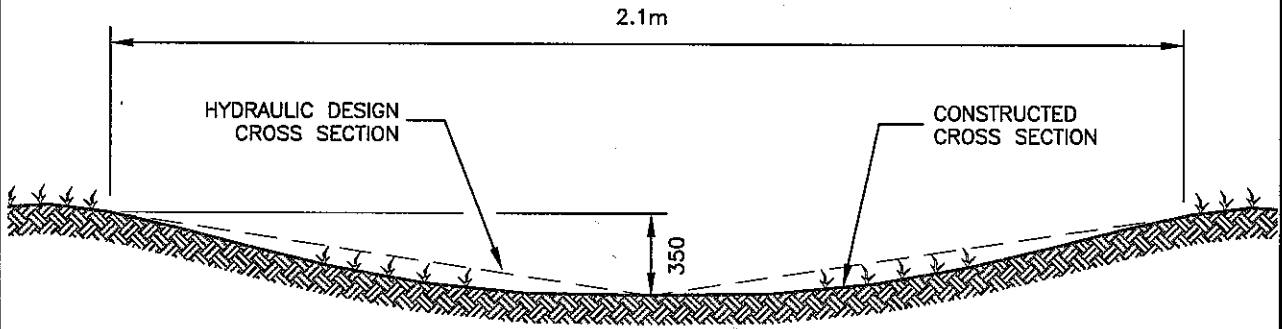
### 8.2 Application

Both devices can be used to convey stormwater flows within the site. They may be used to divert and convey overland flow associated with larger storm events.

### 8.3 Swales

#### 8.3.1 Considerations

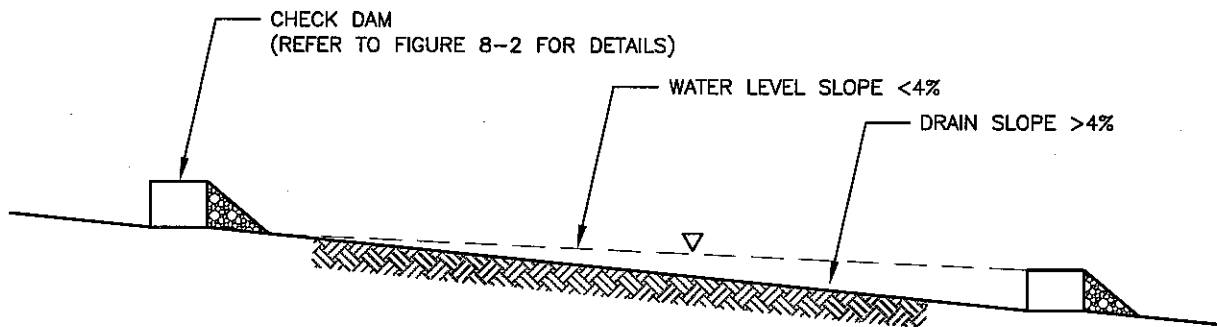
- Swales are generally suitable for gradients between 1 and 4 percent. On steeper slopes check dams may be required within the swales to prevent high velocities and subsequent erosion. A piped underdrain can also be incorporated to the design.
- Vegetative cover of swales generally consists of a dense and continuous cover of relatively long grass. The grass should be maintained at a height of not less than 35 mm and typically 150 mm. Owners must be advised of proper maintenance requirements; swales should not be mown too short, or too frequently.
- The swale size should be based on the dimensions provided on Figure 8-1. The dimensions shown are for effective catchment areas of up to 1000 m<sup>2</sup>. The effective catchment area is equal to the impervious area plus 0.72 times the pervious area.
- Typical check dam details for the swales on Figure 8-1, are shown on Figure 8-2
- Driveways longer than 30 m should incorporate a swale with underdrain similar to the one shown in Figure 8-3.



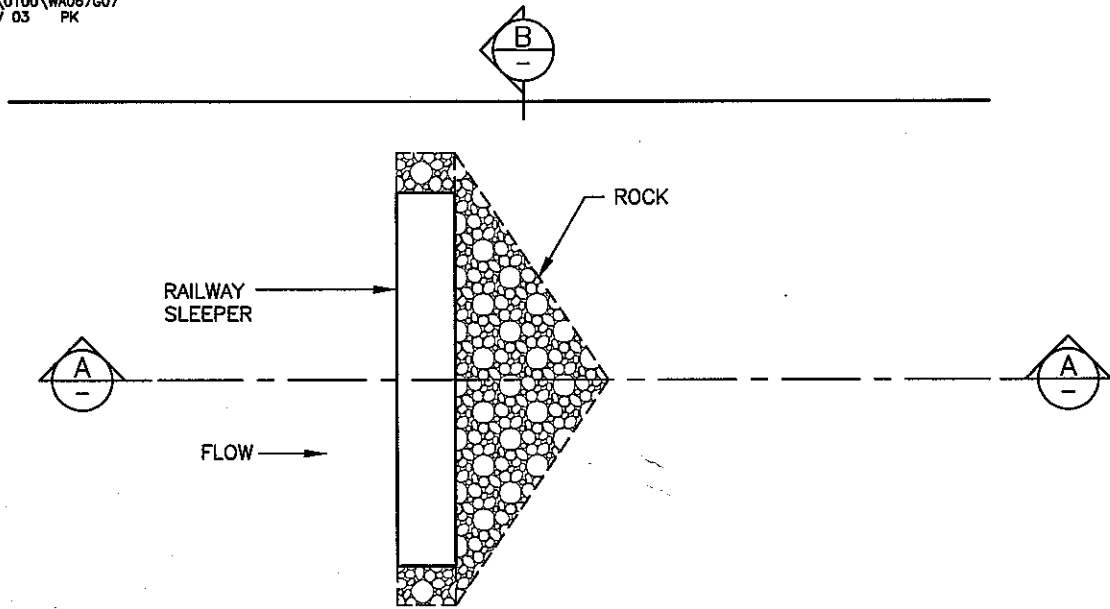
### SWALE CROSS SECTION

**NOTES:**

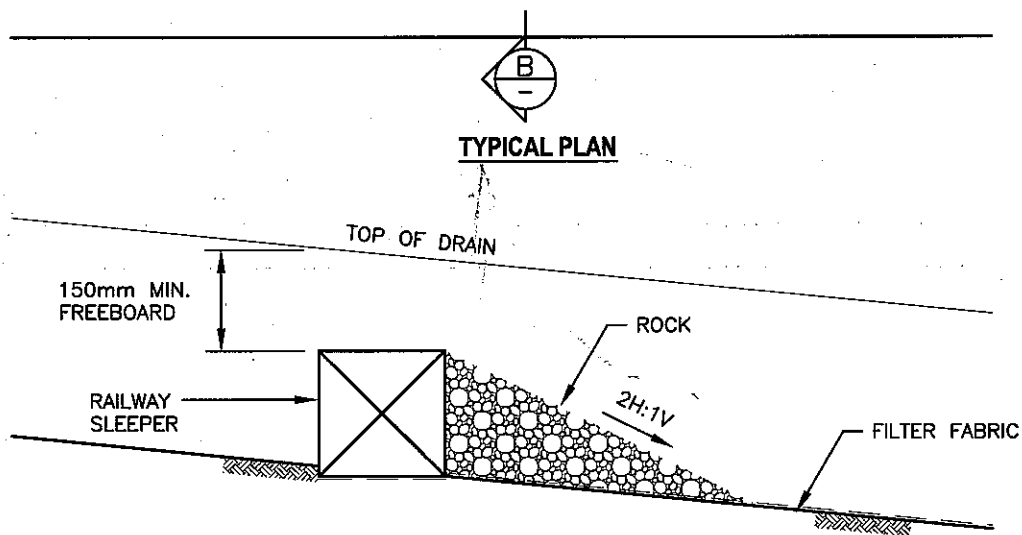
1. TO BE USED FOR ROADWAYS LESS THAN 30m AND TO CONVEY FLOWS FROM ROOF AND OTHER IMPERMEABLE SURFACES.
2. EFFECTIVE CATCHMENT AREAS UP TO 1000m<sup>2</sup>. FOR SWALE DESIGN FOR LARGER EFFECTIVE CATCHMENT AREAS REFER TO STORMWATER TREATMENT DEVICES ARC TP No. 10.
3. EFFECTIVE CATCHMENT AREA DRAINED = IMPERVIOUS AREA + 0.72 x PERVIOUS AREA.
4. MAXIMUM SWALE SLOPE UP TO 4%. STEEPER SWALES REQUIRE CHECK DAMS (REFER TO FIGURE BELOW AND TO FIGURE 8-2)
5. SWALES TO BE GRASSED.



### LOCATION OF CHECK DAMS IN SWALES

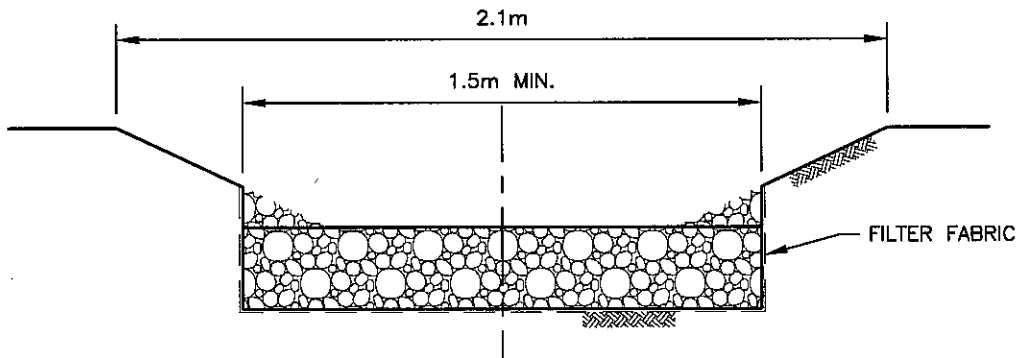


**TYPICAL PLAN**

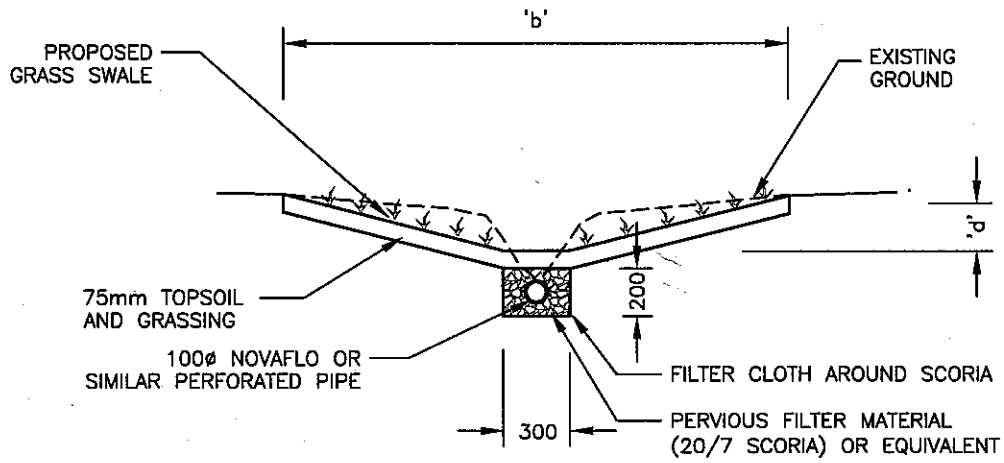


**ELEVATION A-A**

ROCK TO BE SCORIA GRADED CLEAN (SGC) 75-70 OR EQUIVALENT.  
FILTER FABRIC TO BE BIDIM A12 OR EQUIVALENT.



**ELEVATION B-B**



**SWALE CROSS SECTION**

**NOTES:**

1. TO BE USED FOR ROADWAYS LONGER THAN 30m.
2. DIMENSIONS 'b' & 'd' TO BE SIZED FOR CONVEYANCE OF 1% AEP EVENT.
3. EXISTING GROUND IS REGRADED, COMPACTED, TOPSOILED(75mm DEPTH) & GRASSED.
4. MINIMUM SIDE SLOPES OF 1V:3H APPLIES.