

Dry Water Quality Swale

Description: A dry water quality swale is designed to filter and infiltrate pollutants from the WQV storm and convey excess stormwater runoff. The soil bed consists of native permeable soil or imported soil media. Dry water quality swales generally have higher pollutant removal compared to grass channels due their higher retention and infiltration rates.

BMP Information

BMP Type: Conveyance

Targeted Pollutants: Primarily sediment with limited removal of phosphorus, nitrogen and metals.

WQV/Disconnection Credit

Runoff Retention Credit: 50%

Treatment Credit: 25%

Disconnection Credit: 75%

Design Criteria

Drainage Area: ≤ 5 acres

Shape: Trapezoidal or parabolic side slopes $\geq 3:1$; bottom width 2' to 8', $\geq 4'$ recommended

Slope: Up to 6% with check dams, 2% without

Water Depth: ≤ 4 inches for conveyance, < 18 inches for ponded areas (for water quality storm)

Flow Velocity: ≤ 1 ft/s for water quality storm

Separation: Foundations and roadway subbase shall be $\geq 2'$ above ponded elevation if adjacent

Pretreatment: A scour hole or sediment forebay should be provided for concentrated inflow

Soils: NRCS Hydrologic Soil Groups A, B, C*, D*

Engineered Fill: Moderately permeable soil a minimum of 30" deep

*May require using engineering fill with an underdrain



Limitations

Require more maintenance than curb and gutter

Seasonal high water table must be $\geq 2'$ below bottom

Longitudinal slopes must be between 1 – 6%

Poorly drained soils require imported engineered fill with installation of an underdrain

All infiltration BMPs should be located to ensure exfiltration does not saturate an adjacent roadway subbase or foundation

Maintenance Requirements

Monthly inspections until vegetation is established

Annual inspection after initial grow-in period

Mow grass at least once per year

Remove trash and debris

Remove sediment pretreatment rea

Reseed / replant areas of erosion as needed

Cost Considerations:

Capital Cost: Low to Moderate

O&M Cost: Low to Moderate

Notes:

On-site soil analysis and/or infiltration rate testing is required without soil amendments and an underdrain

Engineered fill should consist of moderately permeable soil

References:

2004 Connecticut Stormwater Quality Manual - <http://www.ct.gov/deep/cwp/view.asp?a=2721&q=325704>

Massachusetts Stormwater Handbook - <https://www.mass.gov/files/documents/2016/08/qj/v2c2.pdf>

New Jersey Stormwater BMP Manual - http://www.njstormwater.org/bmp_manual2.htm

Virginia Stormwater BMP Clearinghouse - <http://www.vwrrc.vt.edu/swc/NonProprietaryBMPs.html>

Washington State DOT Highway Runoff Manual - <https://www.wsdot.wa.gov/publications/manuals/fulltext/M31-16/highwayrunoff.pdf>