



The stone swale [right] is designed to mimic a natural stream channel. Its combination of rock and fabric [left] helps trap sediment and promote vegetation. This treatment performed poorly for most evaluation criteria.

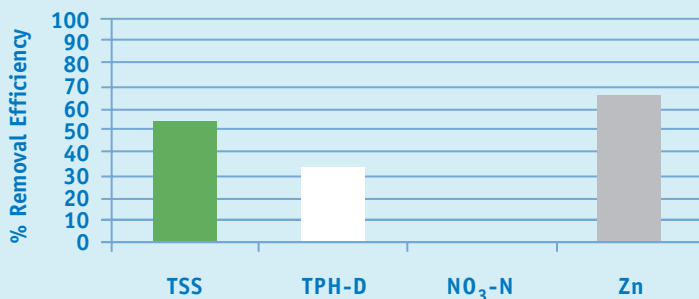
The most common stormwater treatment, swales range from irrigation ditches to engineered systems. Similar in form to a natural stream channel, swales are commonly protected from erosion by a layer of riprap (stone), and underlain with a geotextile filter fabric.

The swale tested here is not to be confused with engineered systems known as water quality swales, which are designed with internal drainage or check dams. State design criteria specify slopes of typically less than one percent, and flow velocities of less than one foot per second for a 10-year storm.

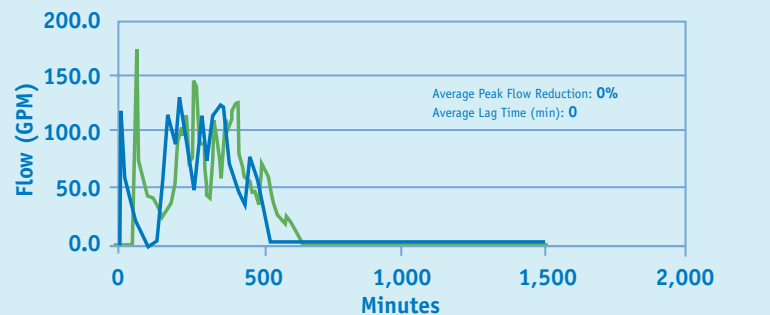
Maintenance demands involve standard landscaping, primarily periodic mowing. Many swales are designed to function as dry systems. Often, however, they collect water due to vegetation and lack of proper maintenance.

Our first year of testing this approach focused on a stone-lined swale; in year two we will examine a vegetated swale; and in year three, a vegetated swale retrofitted with engineered filter berms.

WATER QUALITY PERFORMANCE



PEAK FLOW REDUCTION



Water Quality Treatment Process

Stormwater enters the swale and experiences limited filtration through the spaces between the large stones lining the pathway. If the swale is composed of an appropriate subbase and flow is of low velocity, infiltration can be expected. Slower, non-erosive, flow velocities allow pollutants to fall out of suspension and into the spaces in the riprap.

The combination of rock and fabric help trap additional sediment and develop vegetation over time. In some cases, vegetation is planted during or after

the swale's installation. Commonly, swales are left to passively re-vegetate.

Because of demanding staging requirements in adjacent construction areas, stormwater is commonly directed into swales prior to robust root growth of vegetation. The reported water quality treatment effectiveness of vegetated swales and engineered water quality swales is higher than non-vegetated treatments.

Category Type

Open Channel System

BMP Type

Conventional Structural

Design Source

New York State Stormwater Management Design Manual

Basic Dimensions

Length: 280 ft Width: ~10 ft

Specifications

Catchment Area: 2 acres
Peak Flow: 2 cfs

Treatment Function

Physical

Cost Per Acre

\$11,951.31

Maintenance Data

Maintenance Sensitivity: Low
Inspections: Low
Sediment Removal: Low