Lake Wise Info Sheet

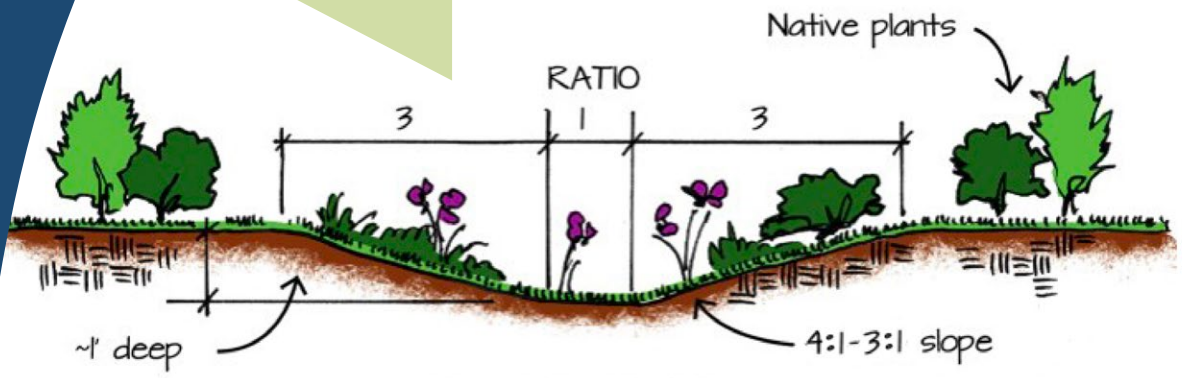
Shoreland Best Management Practices for Lake-friendly Living.

VEGETATED SWALES

Upland stormwater management

Description.

Vegetated swales, also called bioswales, are shallow open channels lined with dense vegetation that slow, filter, and convey stormwater runoff.



VEGETATED SWALE

Section diagram.

VT Guide to Stormwater Management

Benefits

- Water Quality
- Prevents Erosion
- Slow, Spread, Sink Stormwater
- Low Cost
- Low Maintenance
- Wildlife Habitat
- Visual Appeal
- Protection & Resiliency

Acceptable BMP under the Vermont Shoreland Protection Act

Related Info Sheets:

Check Dams
Filter Berms
Rain Gardens
Dry Wells

Applicability.

Stormwater from developed areas including walkways, driveways, and parking lots can be collected, slowed, filtered, and conveyed using vegetated swales. They can also be used to direct stormwater to other treatment practices, such as rain gardens. Vegetated swales can provide some infiltration but are not generally designed for this purpose. Not recommended for steep slopes.

How to.

1. Locate an area where stormwater runoff flows and needs to be slowed or conveyed to a stable area or treatment practice.

2. The size of the swale can be customized to the available space but is generally about one foot deep with gradual side slopes of 3:1 (33.5%). For example, a 1 foot deep swale that is 1 foot wide at the bottom would have 3 foot wide slopes on either side, for a total width of 7 feet.

Locate the swale to maintain a slope of 1-8% in the direction of flow; a maximum grade change of approximately one inch per foot in length. Reduce the slope by running it across a slope rather than directly down. For slopes with a 5% or greater grade change, check dams should be installed to reduce flow velocity and erosion potential (See **Check Dams**) Mark the area where the swale will be installed with spray paint or string.

Drainage stone at the bottom, underneath the topsoil, can increase infiltration and water holding capacity.

The seasonal high groundwater table is recommended to be 3 feet or more beneath the swale, and at a minimum of 1 foot beneath.

VERMONT
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Before: drainage pipe conveys road runoff directly into Lake Shirley, MA.

After: Meandering vegetated swale installed with erosion control slows and treats road runoff, allowing sediments to settle and pollutants to be filtered.

How to.

3. Dig the swale, ensuring that flat center is created.

4. If concentrated stormwater flow is entering the swale, armor the inlet with washed crushed stone to prevent scouring.

5. Six to 12 inches of topsoil from onsite or elsewhere can be added if the subsoil is not a sufficient growing medium for native plants.

6. Temporary erosion control such as erosion control blankets or straw mulch in low flow locations should be applied to the swale, particularly the side slopes, to prevent erosion while vegetation establishes.

7. Plant swales with a diversity of native species that will provide dense vegetative groundcover. Herbaceous species such as grasses, sedges, and flowers that can tolerate both wet and dry soil conditions. Seeding or planting with plugs is the most cost-effective way to achieve dense plant cover quickly. Trees and shrubs can be planted on top of the slopes, typically not the sides. See **Rain Gardens** for more plant resources.

8. Ensure that the vegetated swale outlets to another treatment practice or a stable vegetated area. Armor the outlet with washed crushed stone to prevent scour.

Materials.

- Stakes, string, level, and measuring tape to measure grade
- Spray paint or string to mark area
- Shovel or backhoe
- Washed Crushed Stone
- Topsoil
- Erosion control blanket or straw mulch
- Native Plants

Maintenance.

Periodically remove accumulated sediment, debris, and trash. Inspect the swale after large rain events and in the spring. Repair areas of erosion with erosion control blankets, replanting, or stone. Remove all invasive species.

For more information...

- **The Vermont Guide to Stormwater Management for Homeowners and Small Businesses (2018)**
- **Vermont Green Stormwater Infrastructure Simplified Sizing Tool for Small Projects (2015)**

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