

Grass Swale



General Maintenance

Trash and Debris Removal

Remove trash and debris after rain of more than one inch.

Vegetation Height

Maintain height of six to eight inches in channel, and no less than three inches.

Channel Maintenance

Remove woody vegetation.

Annual Maintenance

Infiltration Maintenance

Remove sediment, dethatch, and disc or aerate swale bottom.

Channel Maintenance

Revegetate and repair holes in channel and side slopes.

Forebay and Underdrain

Assess forebay and underdrain structures (if present). Clean out and repair if needed.

Long-term Maintenance

Every Five Years

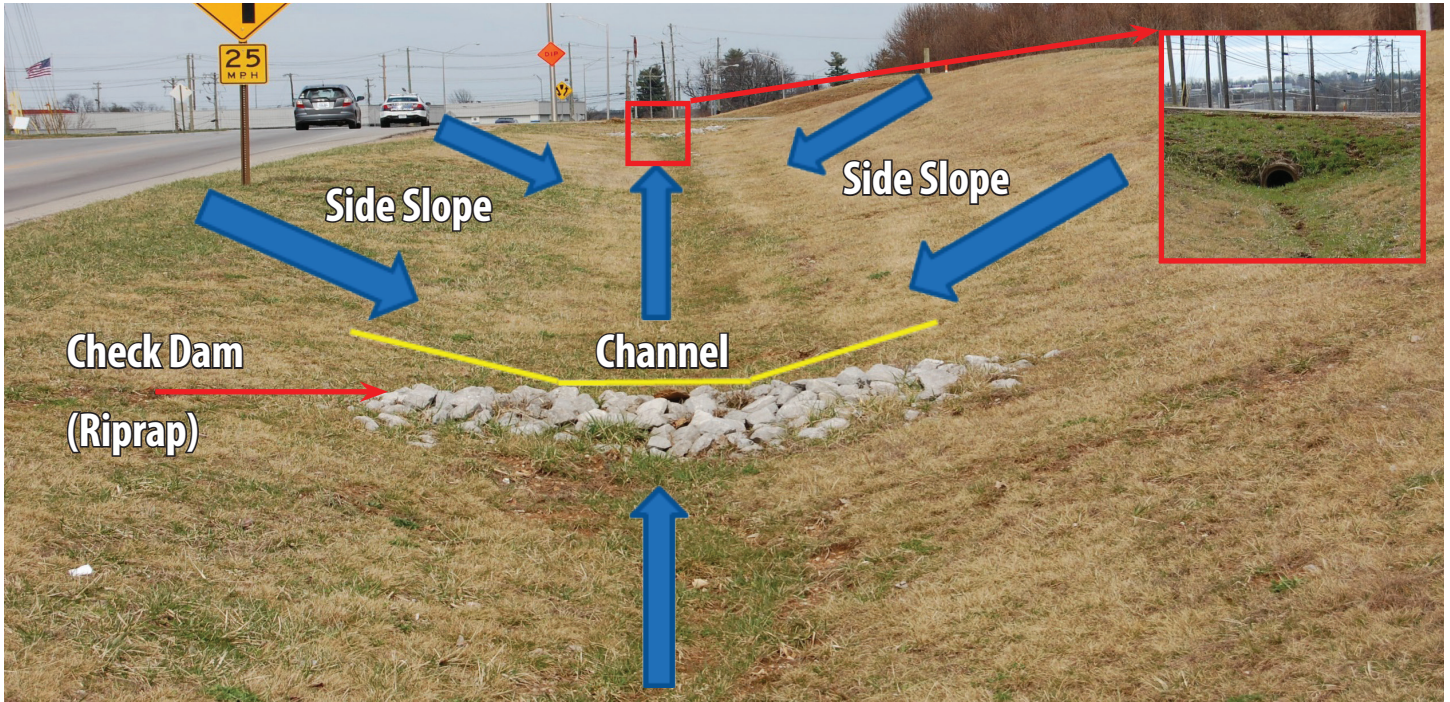
Remove sediment from forebays or sediment storage areas when 60 percent of total volume is lost.

Grass swales, or dry swales, are designed to transport stormwater, promote infiltration, and capture sediment during a storm event. Grass swales are turfgrass-planted channels constructed with wide bottoms to encourage infiltration of stormwater into the underlying soil. Vegetation in the channel functions to reduce the speed of stormwater and trap sediment as water is conveyed through the channel. When functioning properly, these swales hold water no longer than six hours after a storm and should remain dry until the next storm event.

Grass Swale Potential Issues

Issue	What Causes It?	Remediation
Channel holds water longer than six hours. (Indicators include pest insects, strong odor, wetland plants, or stained areas.)	Clogged or broken underdrain, insufficient infiltration, and/or uneven grading	Clean out or repair underdrain (if present). Remove sediment, dethatch, disc or aerate swale bottom, and regrade. Restore ground cover. Dispose of sediment off-site.
Gullies or bare ground appears in or around swale.	Erosion/stormwater runoff	Regrade soil and replant ground cover. Adjust soil pH if needed, apply one-time fertilizer, and water until vegetation is established. Add riprap to slow stormwater.
Holes are present in channel.	Rodents	Maintain vegetation no longer than six to eight inches (may be as low as three inches). Repair holes and revegetate.
Trash or debris is present.	Stormwater runoff	Remove trash and debris.
Excessive sediment is present within the channel.	Sediment accumulation	Scrape swale bottom to restore original design and infiltration rate. Restore ground cover. Dispose of sediment off-site.

Parts of a Grass Swale



Common Issues



Trash and debris accumulate in a grass swale. Trash and debris should be removed after every rain of more than one inch.



Evidence of sediment deposition next to riprap. Excess sediment reduces stormwater infiltration into the underdrain.



Erosion is present on the side slope of this grass swale.

Grass Swale Inspection and Maintenance Checklist

Site name:			
Location:			
Inspector name(s):		Inspection date:	
Rain in previous six hours? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, record amount and timing:			
Current weather conditions:			
Flow or water observed? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, record appearance:			
Inspection item	Yes	No	If no, explain location, extent of issue, and/or maintenance performed.
General Inspection			
Site is accessible.			
Area is clean of trash, debris, grass clippings, etc.			
Vegetation is maintained at height of six to eight inches, and no lower than three inches.			
Woody (trees or shrubs) or invasive plants are absent.			
Erosion protection measures (i.e., turf reinforcement mats or riprap) are in place and functioning.			
Erosion is not evident.			
Water is going through structure (i.e., no evidence of water going around the structure).			
Sink holes, animal burrows, and instability are absent.			
Channel is dry (not applicable less than six hours after rain).			
Long-term ponding is not evident (i.e., no signs of odors, wetland plants, stained areas).			
Sediment			
Excessive sediment has not accumulated within the forebay volume.			
Excessive sediment has not accumulated within the main channel.			
Forebay and underdrain (if present) are free of sediment.			
Forebay/underdrain condition			
No evidence of erosion or runnels forming within the forebay (if present).			
Underdrain is in good condition, with no standing water.			

Glossary

BMP: Best management practice.

Check dam: A small structure built to prevent erosion and control sediment.

Channel: A long, linear, narrow depression that functions to hold and/or convey stormwater.

Erosion: Process by which soil and material are washed away by high volumes of stormwater.

Forebay: A canal or small water basin that receives water prior to water entering a larger basin. A grass swale may or may not have a forebay.

Infiltration: Flow of water from aboveground into the subsurface layers.

Invasive plants: Plant species that tend to spread out of control (e.g., Japanese honeysuckle).

Outlet: Area where water leaves the BMP structure and enters the stormwater system.

Riprap: Large, piled rocks used to slow the speed and erosive properties of water. A grass swale may or may not have riprap.

Sediment: Fine material that is carried by stormwater and deposited as the water settles.

Side slope: The slope on the sides of a channel, draining stormwater runoff to the channel.

Soil mix layer: An engineered subsurface layer composed of permeable soils.

Stone layer: A subsurface layer composed of gravel or stone that houses the underdrain, facilitating percolation into the underdrain.

Turf reinforcement mats: Woven, synthetic-fiber mats that provide temporary cover for bare soil, protection against stormwater erosion, and long-term vegetation support.

Underdrain: A drainage pipe installed underground to collect subsurface water. It functions to convey subsurface water to a stormwater system.

References

City of Bowling Green, KY. Stormwater Best Management Practices Manual. Post-Construction Stormwater Control Practices: PTP-02 Open Channel Systems. Accessed February 11, 2022. <https://www.bgky.org/stormwater/bmp>

NC State University Cooperative Extension Services. Stormwater SCM Inspection and Maintenance Certification Materials. Dallas, NC. February 12-13, 2020.

Northern Virginia Planning District Commission Division of Environmental Services. Maintaining Your BMP: A Guidebook for Private Owners and Operators in Northern Virginia. February 2000, pp. 1-21.

U.S. Environmental Protection Agency. National Management Measures to Control Nonpoint Source Pollution from Urban Areas. Management Measure 11: Operation and Maintenance. November 2005. EPA-841-B-05-004.

Cooperative Extension Service

Agriculture and Natural Resources
Family and Consumer Sciences
4-H Youth Development
Community and Economic Development

MARTIN-GATTON COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity. Reasonable accommodation of disability may be available with prior notice. Program information may be made available in languages other than English.
University of Kentucky, Kentucky State University, U.S. Department of Agriculture, and Kentucky Counties. Cooperating.
Lexington, KY 40506



Disabilities
accommodated
with prior notification.