

YOU CAN Drain a Wet Spot

GRASSY SWALE WITH OPTIONAL UNDERDRAIN



DESCRIPTION: A linear depression (swale) planted with lawn grass, native grasses, and/or wildflowers, which can intercept and infiltrate stormwater along its length.



TIME/COMPLEXITY: 2 to 3 days, moderate to complex



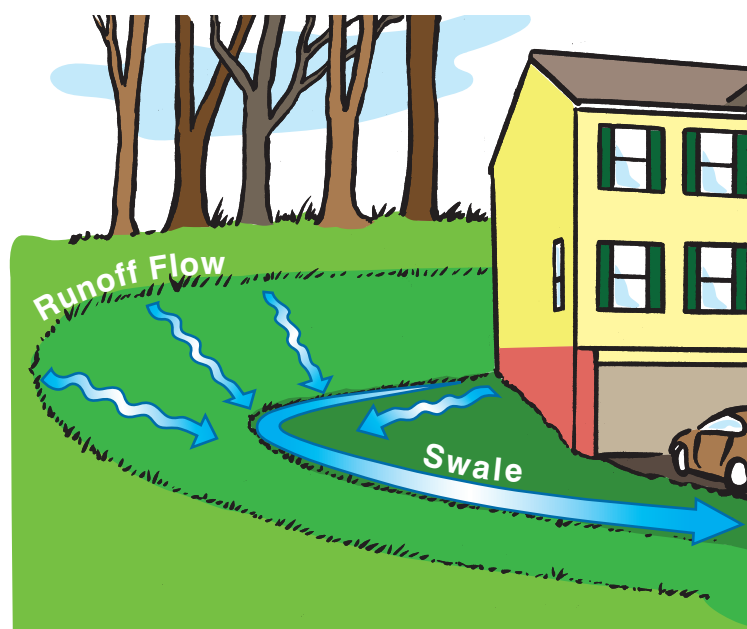
COST: variable: \$15 per foot length, depending on length of drainage way



TOOLS/MATERIALS: shovel or small excavator, 4" perforated PVC pipe, 4" cap, clean gravel, straw or geotextile fabric, plants, turf reinforcement mat (optional)

STEPS:

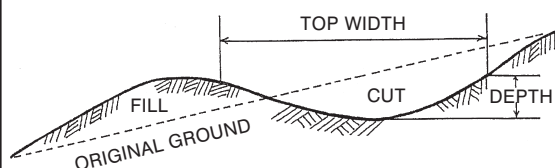
- 1. LOCATION:** A grassy swale or underdrain should be located below a source of stormwater runoff on level to gently sloping ground, at least 10 feet away from a foundation wall, and should be laid out to not interfere with underground utility lines and septic fields. Perform a ONE-CALL* prior to planning and digging and contact your municipality to see if any permits are required.
- 2. DRAINAGE AREA:** Determine where the stormwater runoff is coming from. Lay out a perpendicular or nearly perpendicular line that would intercept this flow. This line should be laid out to slope away from and around any structures or site amenities.
- 3. DESIGN:** The swale surface cross-section should be curved or trapezoidal in shape to allow water to spread out and flow freely without carving an eroded gully. An underdrain can be placed in the centerline of the swale or slightly off-set to capture the flow and encourage infiltration into underlying soil layers.
- 4. LAYOUT:** Use a measuring tape, and string, flexible garden hose, or marking paint to layout the edges of the swale and underdrain. Mark the edges of the width of the excavation (nominally 1 to 2 feet for an underdrain and 5 to 10 feet from the centerline for a swale). Strip the grass sod or other surface material from the area.



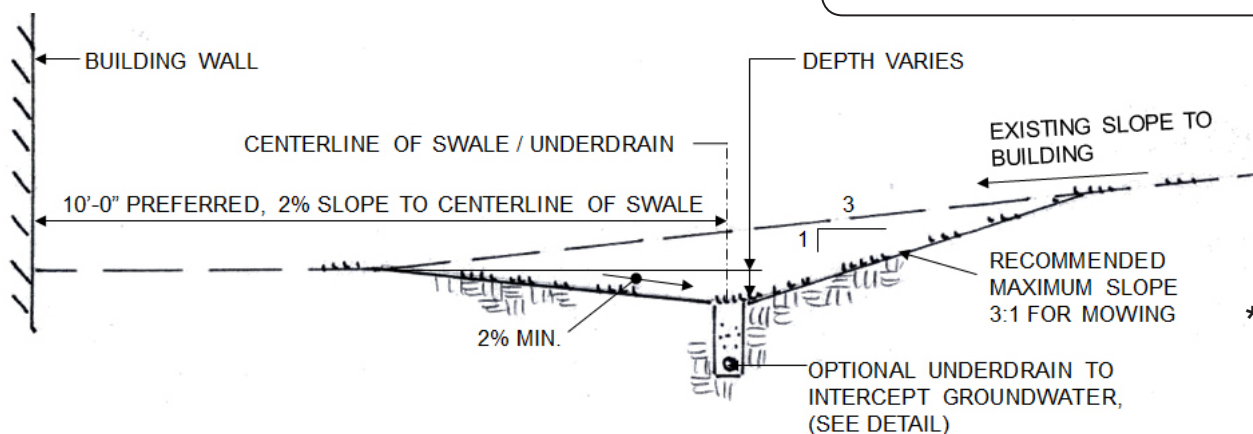
Create a gentle swale to direct water from the high side of the yard to the low side of the yard around the house. Maintain 2% minimum slope along the centerline of swale.

3

CROSS SECTION



SURFACE SWALE



Know what's below.
Call before you dig.

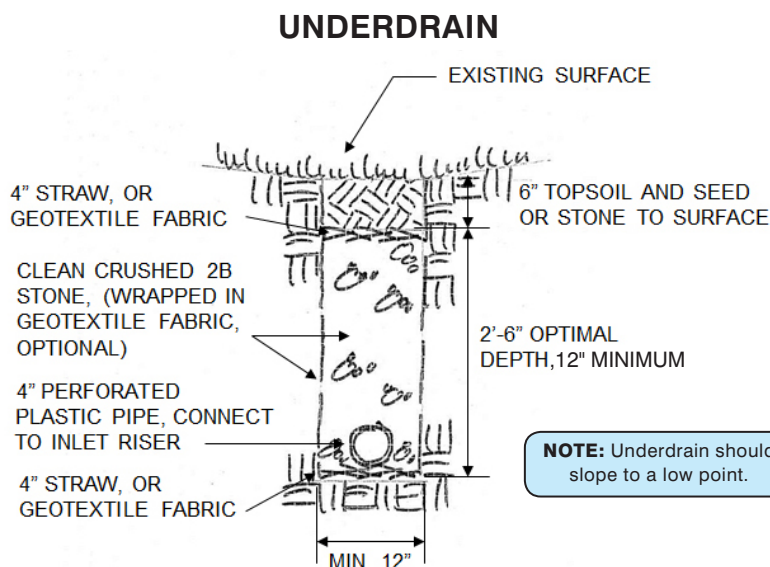
5. EXCAVATION: Begin digging by hand or with a small excavator to reach a depth needed to drain the area, but no shallower than six inches for a swale, more for an underdrain. On sloping ground, the excavated material can be used to create a berm around the lower sides of the swale and placed level with the upper side where the ground is undisturbed. By building up the lower side of the swale, there will be less digging to meet the required depth needed.



Trenching and backfilling an underdrain

6. DRAINAGE LAYERS: An underdrain is always a good idea if you are not sure the soils in the swale will be able to soak up the excess water. Many of our soils have a high clay content and take a long time to soak up water. An underdrain allows the water to get to deeper layers that may soak up more water.

- a. Backfill the excavated hole with a 4" layer of straw on the bottom or lay down some geotextile fabric to prevent the underlying soil from mixing with the stone layer. Straw will compact to an inch or so with the subsequent layers on top of it.
- b. At the same time, place the clean stone drainage layer and the perforated pipe underdrain over the straw or fabric. Install a cap at the upper end of the perforated pipe.



- c. When the underdrain pipe is covered over with the clean stone layer, place another 4 inches of straw or a single layer of geotextile fabric to keep the upper soil layer from filtering into the stone layer.
- d. Outlet the underdrain to an existing drainage way or a stable vegetated area preferably 75 feet from a property line or street gutter. Rock at the pipe outlet helps dissipate the water and an animal guard on the pipe end prevents any nests. Drains should not be directed or outletted to a neighboring property where it may adversely affect others.

7. PLANT SELECTION AND PLANTING: The swale can be lined with a turf reinforcement mat to protect the swale from erosion until vegetation has taken hold. The swale should be seeded and mulched with a dense growing lawn or meadow seed mix. Refer to the recommended seed mix chart below. Mulch the area with straw or compost to encourage growth. Water the area regularly to encourage growth.



Seeding and mulching a swale

SEED MIX RECOMMENDATIONS

Locally recommended lawn seed or a mix of wildflowers and native grasses similar to the following:

Virginia Wildrye, (*Elymus virginicus*)
 Indiangrass, (*Sorghastrum nutans*)
 Deertongue, 'Tioga' (*Panicum clandestinum* 'Tioga')
 Big Bluestem, 'Niagara' (*Andropogon gerardii*, 'Niagara')
 Switchgrass, 'Carthage', (*Panicum virgatum*, 'Carthage')
 Partridge Pea, (*Chamaecrista fasciculata*)
 Autumn Bentgrass, (*Agrostis perennans*)
 Blue Vervain, (*Verbena hastata*)
 Blackeyed Susan, (*Rudbeckia hirta*)
 Oxeye Sunflower, (*Heliopsis helianthoides*)
 New England Aster, (*Aster novae-angliae*)
 Soft Rush (*Juncus effusus*)

Produced by
Westmoreland Conservation District
 Phone: 724-837-5271
 www.wcdpa.com

With Funding from

pennsylvania
 DEPARTMENT OF ENVIRONMENTAL PROTECTION