

Dry Enhanced Swales/Wet Enhanced Swales

An enhanced swale is a vegetated open channel designed to capture and treat stormwater runoff within dry or wet cells formed by check dams or other means. Enhanced swales are generally shallow, wide, and vegetated to help slow and filter stormwater runoff.



There are two different types of enhanced swales. The first is a dry swale which includes a filter bed of prepared soil that overlays an underdrain system. They are designed to let stormwater be filtered or infiltrated through the bottom of the swale. Because they are dry most of the time, they are often the preferred option in residential settings. The second type of enhanced swale is a wet swale. Wet swales are designed to retain water or marshy conditions that support wetland vegetation. Because this practice is meant to retain water, they are generally used in areas with a high water table or poorly drained soils. Wet swales achieve pollutant removal both from sediment accumulation and biological removal.

There are some common problems to be aware of when maintaining an enhanced swale. They include, but are not limited to, the following:

- Sediment build-up
- Clogging in the inlet and outlet structure
- Establishing vegetation
- Clogging in the underdrain (if applicable)
- Mosquitoes breeding in the practice
- Ant mounds
- Maintaining the proper pH levels for plants
- Pruning and weeding to maintain appearance

Routine inspection and maintenance should be performed on the dry or wet enhanced swale to ensure that the practice is properly functioning. Note that during the first year the enhanced swale is built, maintenance may be required at a higher frequency to ensure the proper establishment of vegetation in the practice. For more information on vegetation within a swale, see Appendix D: Planting and Soil Guidance. Enhanced swales should be inspected after a large rainstorm. Keep drainage paths, both to and from the BMP, clean so that the water can properly flow in and out of the practice.

In addition to routine maintenance, dry or wet enhanced swales have seasonal and intermittent maintenance requirements. For example, during the winter months, the enhanced swale should be inspected after a snow event (this is specific to northern areas of Georgia). Accumulated snow adds

additional weight and may compact the dry enhanced swale soil, which would reduce its infiltration capacity. In addition, check to make sure that the materials used to de-ice the surrounding areas stay out of the practice to avoid clogging and further pollution. Note that it might take longer for the water to infiltrate into the ground during the winter months and early spring.

If the dry enhanced swale is not draining properly, check for clogging in the inflow and outflow structures. Another consideration would be the permeable soil layer, which could be clogged or over-compacted. In a dry enhanced swale, the media is likely to become clogged at the upper layer of the soil first. Potential sources of excessive sediment that could clog the media include ant mounds and unstable soil upstream of the practice. Possible sources of compaction are vehicles, such as tractors, traveling through the practice. If the media is clogged or over-compacted, then the media should be replaced. If the practice includes an underdrain, a structural repair or cleanout to unclog the underdrain may be necessary.

In order to keep the water that exits the dry or wet enhanced swale clean, fertilizers should only be used sparingly during the establishment of the practice. Once the vegetation in the practice has been established, fertilizers should not be used. While vegetation in the enhanced swale is important, the primary purpose of an enhanced swale is to act as a water quality device, and introducing fertilizers into the enhanced swale introduces nutrients such as phosphorus and nitrogen that can pollute downstream waters. In addition, enhanced swales should already be nutrient rich environments that do not require fertilization. To control animal nuisances and invasive species, pesticides (including herbicides, fungicides, insecticides, or nematode control agents) should be used sparingly and only if necessary.

If designed and maintained correctly, there is no danger of dry enhanced swales becoming a breeding ground for mosquitoes. A mosquito egg requires 24-48 hours to hatch. In addition, it takes 10-14 more days for the egg to develop and become an adult. By having a dry enhanced swale that drains properly (within 24-48 hours), it is unlikely that a dry enhanced swale would provide a habitat that could become a breeding area for mosquitoes. Should the dry enhanced swale become a breeding ground for mosquitoes, the problem is likely with the soil media or the overflow structure which may need to be addressed.

The table below shows a schedule for when different maintenance activities should be performed on an enhanced swale.

Enhanced Swale Typical Routine Maintenance Activities and Schedule

Activity	Schedule
<ul style="list-style-type: none"> • Prune and weed to maintain appearance. • Dissipate flow when erosion is evident. • Remove trash and debris. • Remove sediment and debris from inlets and outlets. • Remove sediment build-up within the bottom of the swale once it has accumulated to 25% of the original design volume. • Remove and replace dead or damaged plants. 	<p style="text-align: center;">As needed or 4 times during growing season</p>

Activity	Schedule
<ul style="list-style-type: none"> • Mow the dry enhanced swale as necessary to maintain a grass height of 4-6 inches, ensuring grass clippings are not placed in the practice. • Observe infiltration rates after rain events. Dry enhanced swales should have no standing water within 48 hours of a storm event (though 24 hours is more desirable). • Inspect for evidence of animal activity. 	
<ul style="list-style-type: none"> • Inspect for erosion, rills, or gullies and repair. • Replant wetland species (for wet swale) if not sufficiently established. • Test the planting soils for pH levels. Consult with a qualified licensed Professional to determine and maintain the proper pH levels. • Inspect pea gravel diaphragm for clogging. 	<p style="text-align: center;">Annually (Semi-annually the first year)</p>
<ul style="list-style-type: none"> • Trim planting material. • Inspect for snow accumulation. 	<p style="text-align: center;">As needed or during winter months</p>
<ul style="list-style-type: none"> • Replace/repair inlets, outlets, scour protection or other structures as needed. • Implement plant maintenance plan to trim and divide perennials to prevent overcrowding and stress. • Check soil infiltration rates to ensure the dry enhanced swale soil is draining the water at a proper rate. Roto-till or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours. 	<p style="text-align: center;">2 to 3 years</p>