

INSPECTING STORMWATER MANAGEMENT PRACTICES

GUIDANCE FOR PRIVATE OWNERS



INSPECTION REQUIREMENTS

Permanent stormwater practices (e.g., Wet Pond, Bioretention Basin, Infiltration Basin) installed as part of a stormwater management permit are required to be maintained by the property owner. Maintenance is critical for the practices to operate as designed and to effectively treat stormwater runoff from the site. The pollutant removal, channel protection, and flood control capabilities of all practices will decrease if regular inspection and necessary maintenance is not performed. Inspection frequency requirements vary by practice, but at a minimum all components of your stormwater practices should be thoroughly inspected at least once per year, and after all rainfalls of 0.5 inches or greater. Check your approved maintenance agreement for practice specific inspection requirements.

The cost, level of effort, and expertise required to maintain stormwater practices varies depending on the type, size, and complexity of the practice. Routine maintenance, such as mowing and removing debris or trash, is needed multiple times per year and can easily be performed by most landowners. More significant maintenance, such as removing accumulated sediment is needed less frequently, but requires more skilled labor and special equipment. Repair of critical structural features that are failing, such as embankments and outlet structures, needs to be performed by a qualified professional that has experience in stormwater. Below is guidance on inspecting common components of stormwater management practices, along with information on when a professional may need to be contacted.

OUTLET STRUCTURES

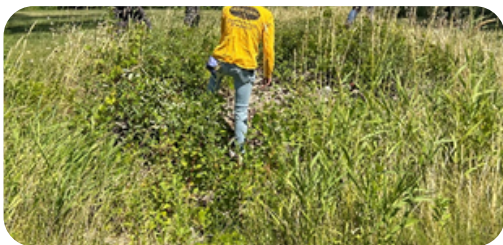
Outlet structures are generally the primary means through which water leaves the facility. They can be concrete with one or more holes- or orifices, along with an open top, or they can be simple standpipes. These often have grates or trash racks on them to reduce the chance of clogging. One or more pipes may connect within the structure.

The inspection of these features involves checking to make sure all parts of the structure are in place (grates, drainage stone, etc.) and looking for debris that may interfere with water entering or leaving the structure, as well as overall structural integrity.

Action Item: Keep the trash rack and outlet area free of sediment, trash, and problem vegetation. Contact a professional if the structure is damaged.



A riser pipe with trash rack



Before and after photos of vegetation management on riprap surrounding an outfall

STORMSEWER OUTFALLS

Many sites direct water to stormwater facilities via underground pipes, also called stormsewers. The location where these enter the facility, or where water discharges to a waterbody, is called an outfall (sometimes referred to as inlet pipes). Outfalls often have stone or riprap protection at the end of the pipe to protect the surrounding ground from the erosive power of the exiting water.

The inspection of these features involves looking for debris or overgrown vegetation that may interfere with water exiting the pipe, the presence and condition of the riprap protection, the presence of erosion or scour, and the buildup of sediment within the pipe or riprap.

Action Item: Keep stormsewer outfalls free of trash and debris, and remove sediment. Also remove plants, especially trees and other wood vegetation, that tend to grow near the end of the pipe. Contact a professional if unable to repair broken trash racks.



The berm of an infiltration basin with tree growth on the side slopes

BERMS

Stormwater facilities are often sunk into the landscape to capture and store water. The sides that rise from the bottom of the facility are called berms, also known as the side slopes or embankments. These are vegetated with either native vegetation (ideally) or turf grass.

Inspection of this component involves walking around the entire perimeter of the facility looking for the required vegetation, ensuring there are not invasive species or other undesirable weeds, and looking for signs of seepage, erosion, or animal burrow holes.

Action Item: Maintain vegetation on the berms in accordance with the approved plan in order to reduce erosion. Do not drive vehicles on berms. Contact a professional engineer if the berms of a stormwater management practice show signs of erosion, seepage, or failure.

FACILITY BOTTOM

The bottom of a stormwater facility is usually flat and can be vegetated (in the case of infiltration facilities or dry detention basins), wet (in the case of wet detention basins), or stone (in the case of an infiltration trench).

Inspection involves verifying the correct bottom vegetation and condition (wet or dry), and looking for erosion, subsidence/holes, or accumulation of sediment. If a liner is visible, check it for holes.

Action Item: Restore to original design if the facility bottom isn't maintained in accordance with the plan, fill holes with appropriate material. If sediment accumulation appears significant, contact a professional engineer as removal may be required.



A poorly maintained facility bottom. Weeds have taken over and covered the outlet structure.



VEGETATION

If not already considered under a previous heading, the vegetation of the facility should be verified. Maintaining the required vegetation can help the facility function by encouraging infiltration, in the case of native vegetation, and holding soil in place to prevent erosion.

Vegetation inspection involves identifying the type of vegetation, presence of invasive or undesirable species, and the evaluation of overall density, health, and condition. Make a note of the species and location of unwanted vegetation.

Action Item: Maintain vegetation in accordance with approved plans. Fill bare spots with appropriate vegetation, and remove and treat invasive species in accordance with recommended procedures.

Pictured: Before and after photos of vegetation management at a neglected bioretention basin. Once woody vegetation and invasives were identified and removed, the basin was replanted with natives to fill in bare areas.

EMERGENCY SPILLWAY

Most facilities will have a designed overflow location to handle large storms. These are often low points in the berm around the facility and they can be vegetated, armored with stone, or reinforced with concrete.

Inspection should include verifying the condition of vegetation (appropriately mowed with no woody vegetation, bare spots, or erosion), stone, or concrete.

Action Item: Keep free of trees and other unwanted vegetation. Remove any trash and yard debris, and contact a professional engineer if you see signs of concerning erosion.



A riprap reinforced overflow spillway with minor vegetation growth

STONE & RIPRAP

Stone is used in stormwater facilities for several reasons including scour/erosion protection, infiltration, oil and grease absorption, and flow control. The site plan or map should identify where stone is required, the size and type of stone, and its purpose.

In the case of oil and grease control, inspection of the stone involves verifying the presence of stone, verifying that water can pass through the stone (should not be covered by sediment), and is not dark grey (dark grey indicates that the stone is saturated with oil/grease and needs to be replaced). In the case of outfalls, inspection involves verifying the presence and size of the stone, identifying any erosion areas around or under the stone, and identifying any overgrown or woody vegetation that may interfere with water exiting the pipe.



A stone weeper with unwanted vegetation growth

Action Item: Remove vegetation growing between stones, replace stones as needed with similarly sized stone of the same material. Contact a professional engineer if you see any signs of major erosion as redesign may be needed.

CULVERTS, SWALES, & OTHER CONVEYANCE FEATURES

Culverts can be used to help direct stormwater to treatment practices. The site map plan should identify culverts that are a part of the facility. Culverts should be kept clear of any trash and debris, sediment, or vegetation growth near the pipe inlets. Some culverts may have riprap on the downstream side which should be checked and replaced as needed.

Inspection of culverts includes checking for trash and debris in the pipe, sediment accumulation, and vegetation growing in or near the pipe inlets. Some culverts may have rodent guards or trash racks whose condition should be checked for signs of failure. If riprap is present on the downstream side, it should be inspected for erosion sediment accumulation, and vegetation growth.



A culvert with a rodent guard gate and visible sediment accumulation

Action Item: Remove any unwanted vegetation from inlets, remove noticeable sediment accumulation, and clear any trash and debris that may be clogging the pipe.

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For more information regarding
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