What to Look for When Inspecting a Stormwater Basin

Click here for the Basin Inspection Form

[**Click here for examples of problems in basins.**]

What is a stormwater basin and how do they work?

Parts of a stormwater basin. Not all basins have every feature. Older basins may just have a very basic design and were designed primarily to control flooding. Newer basins may have additional features designed to improve water quality, to release some of the water into the ground (infiltration), and to control the rate at which the water is discharged from the basin.

[Click on photos to enlarge.]

Berm – the earthen structure that holds water in the basin.	
Storage volume – where the basin holds the water.	
Inlet/Endwall – the way water gets into the basin, such as from a pipe or swale. An endwall is a structure located at the downstream end of a pipe.	
Outlet – the structure that controls how fast the water leaves the basin.	

	 Early outlet structure (flood control only).
Vegetation – plants such as grass or wetland species that protect the soil or medium from being washed away (eroded). They can also improve water quality by removing nutrients.	
Emergency spillway – a low point in the berm that allows water to overflow in a controlled manner if it gets too deep. Some are grass and some are concrete lined as in this example.	

Other structures (not found in all basins):

Trash Rack – metal grid used to keep trash and larger debris from clogging the outlet	

Forebay – separate area at the inlet used to trap debris and sediment and keep it out of the main part of the basin.	
Infiltration medium – modified soil that allows water to soak into the ground. This one is still being established, so it is not covered with vegetation yet. Note forebay near far end. **For inspection of an infiltration basin, see:** Infiltration	
Underdrain – perforated pipe under the infiltration medium that allows the basin to be drained. Under the ground in the basin, it is visible in the outlet structure (shown opened).	
Rock Apron – area of large stones (rip-rap) used to slow the flow of water at the inlet and/or outfall to reduce erosion.	

To Mow or Not to Mow?

Unless the mowing frequency is defined in the maintenance instructions for your basin, there are options for how often to mow in the basin. In situations like the top example it may be desirable to keep the basin mowed in the same way as the rest of the lawn. If part of the basin remains wet, as in the middle example, mowing only the dry areas may make sense. It will not hurt the function of the basin to only mow it once or twice a year, as in the basin on the bottom. More vegetation means larger root systems, better erosion prevention and greater water uptake and transpiration. The vegetation also helps with filtration and sediment trapping. Unless the basin is too wet to mow, it should be mowed at least once per year to prevent the growth of trees and shrubs which could damage the basin. If you are not mowing the basin, be sure to keep the inlets and outlets clear, trash racks clean, and to keep woody plant species under control.

Problems in basins

Basins should remain free from obstructions. In this case, because it was shallow, the farmer who was leasing the land didn't realize that he had planted corn in a stormwater basin.

If there is a spring or other source of frequent flow in a basin it can erode a channel from the inlet to the outlet. This can happen without frequent flow. In basins where the problem is recognized in the design stage, a small concrete lined swale (called a low-flow channel) can prevent erosion. If that is not the case, then steps need to be taken to prevent the erosion.

A concrete lined low-flow channel can prevent erosion.

Erosion caused by flow from an inlet into a basin. In this case, the flow rate was too high for the lawn. To repair this so that the problem doesn't return will probably require the installation of protective matting prior to reseeding, or the addition of a rock apron energy dissipator.

This inlet/endwall carries flow into a basin. It has not been well maintained, and has become partly blocked with sediment, which has started to support vegetation, further interfering with the flow. There is a rock apron under the sediment that must be cleaned out, or the rip-rap replaced.

This outlet structure has a trash rack which has not been kept clean. This can lead to the basin not draining quickly enough, potentially damaging or killing the vegetation in the basin, requiring replacement of the plants.

Sediment accumulation can occur in a basin if the water entering the basin is contaminated. If the sediment reduces the volume of water the basin is able to store, it must be removed and the basin restored to its original condition.

Downspouts often need erosion protection. This one drains directly into a basin. The eroded area needs to be repaired and reseeded, and protection, either rip-rap or a splash block.

During construction basins are configured to catch the sediment running off the bare earth where lawn will eventually be planted. Once the lawns are established and no bare earth remains, the basin will be reconfigured to act as a detention basin, its final form. In the basin above, the subdivision's developer never changed the configuration from the sediment control basin. The corrugated metal riser pipe has since rusted off, leaving the basin not working for either configuration.

Rock apron at a basin inlet partly blocked with a dense growth of cattails (*Typha latifolia*). If the flow rate of water entering the basin is significantly slowed by the plants, they should be removed, and the rock apron restored to the original condition to prevent water from backing up upstream causing local flooding. If the flow rate is fairly low, the cattails may do a better job of filtering and slowing the flow than the rock apron alone.

In areas where the bedrock is limestone (karst topography) erosion can lead to sinkholes. This one opened up in a stormwater basin. The sinkhole is substantially larger underground. This problem usually requires an engineered solution to prevent them from returning.

Bare Spots

If there are bare spots where the vegetation is not growing well, they should be reseeded. If the bare spots are being caused by problems, such as ponding of water, or erosion, the cause of the bare spots may need to be corrected in order to get the vegetation established. Bare spots will lead to erosion, sediment pollution into waterways, and potentially damage to the structure of the basin.

Animal burrows, such as from a ground hog, can damage the structure of a basin. If the burrow goes though the berm, it will lead to erosion and potential failure of the berm, necessitating very costly repairs.

Basins do not need to be ugly. This one is in Wabash Landing.

Detention Basin Inspection Form

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