

Stormwater Management Basin Maintenance Guide



PROVIDED BY:

MADISON COUNTY



Detention and Retention Basin Management

Retention and detention basins are a popular form of stormwater control in both residential and commercial developments. Stormwater flow increases when natural areas have altered hydrology. Hardened surfaces such as building footprints, roads, driveways and parking lots prevent infiltration of water during storm events. To address this issue and prevent flooding and ponding, stormwater controls are constructed as permanent structures. These are commonly referred to as post-construction stormwater controls or best management practices (BMPs). Retention and detention ponds are popular choices for larger developments.

Retention ponds are also known as “wet ponds” because they are designed to retain a certain level of water indefinitely. Many developments label these as “lakes” for aesthetic reasons. Because retention ponds perpetually contain water, they can also function as natural systems. Some wet ponds are built to include wetland areas or even fish habitat.

Detention ponds are also known as “dry ponds” because they are designed to be dry until a rain event. Detention ponds are outfitted with an outlet structure that is designed to empty the basin within 18-36 hours after a rain event.

Why is Maintenance Important?

Routine maintenance of stormwater management structures like retention and detention basins is important for proper functioning. If a retention basin is functioning as a manmade lake or pond, maintenance will be especially important for aesthetics and any fish or wildlife habitat created by the ponded water. Common maintenance tasks include debris/litter control, sediment removal, vegetation management, structural inspections, wildlife and insect control, and embankment stabilization.

Another important aspect of maintaining stormwater BMPs is documentation. Inspections, maintenance activities, consulting projects and repairs should all be documented for future reference. Certain permits may be required for large scale maintenance or repair projects so it is a good idea to contact the planning/building department to discuss the specifics before beginning large projects.

The following pages include additional information on sediment control issues, vegetation management, insect and wildlife management, and inspection techniques.

Retention Pond:
Collects and stores stormwater. Water is retained and evaporates or infiltrates the ground.



Detention Pond:
Collects and releases stormwater to storm sewer or a natural drainage system (creek, bayou, or river).



Common Maintenance Tasks:

- Debris/litter control,
- Sediment removal,
- Structural inspections,
- Vegetation management,
- Wildlife and insect control, and
- Embankment stabilization.

Sediment Management and Storm Drain Maintenance

Storm drain maintenance includes debris/litter control, sediment management and structural inspections. One of the essential functions of retention and detention basins is sediment removal. Stormwater, as it moves across the land and drains into a basin, collects small particles of dirt that can cloud up water systems. Retention and detention basins are designed to allow that sediment to “settle out” of the water before the water moves into the storm drain system and ultimately ends up in our rivers, streams, lakes and ocean. Over time, the settled out sediment becomes an issue by reducing the depth of the basin.



Storm Drain Management tasks:

- Routine inspections of storm drains should be completed on a monthly basis. Leaf litter, trash, and other debris should be cleared from the inlet structures to prevent blockage which can lead to flooding.
- Inlet and outlet structures should be inspected for sediment accumulation at least once per year. Inlet structures should have sediment removed so that it does not restrict water flow. Outlet structures and energy dissipaters will also need sediment removal to ensure proper functioning. When riprap is used as an energy dissipater, it should be replaced if it is clogged with sediment.
- Sediment should be removed from inside the pond every 5-10 years or when the sediment depth is more than 6-12 inches. Sediment removal should be done by a professional who can reestablish the original dimensions of the pond based on the as-built engineering drawings.
- Consult an engineer or other professional if the basin is not functioning properly despite efforts to address sediment accumulation.

Insect and Wildlife Control

Retention basins may be stocked with fish early in the community’s development stage. It is important that native fish species be used in the stocking process to ensure longevity of the fish and continued functionality of the eco-system. Native fish feed on native insects so they can be helpful in the control of insect populations in the area. If the fish population seems stressed, contact a fisheries specialist to ensure the best outcome for your fish population.

Occasionally, mosquitoes can become an issue for retention ponds (and dysfunctional detention basins). Any time water is allowed to pool for extended periods of time, mosquitoes can become a problem. With properly designed healthy aquatic systems in place, most retention basins contain natural fish and insect predators to limit the threat of mosquitoes. If the mosquito population becomes a nuisance, contact the City of Ridgeland Public Works Department (601-853-2027) for information on preventing and controlling mosquito infestation.

Vegetation Maintenance

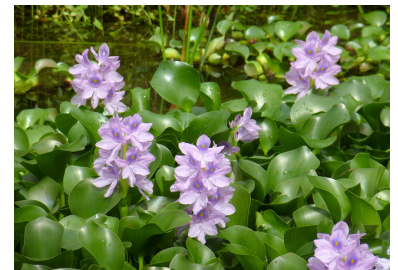
The vegetation surrounding a stormwater control device can remove pollutants and excess nutrients from stormwater. This vegetation filters sediment and protects the nearby soils from erosion. The areas surrounding a retention basin should be re-established with native species and allowed to grow un-mowed for at least 15-25 feet from waters edge (buffer area). This buffer area should also be maintained without chemicals. If a manmade wetland is established, it should be monitored carefully for invasive species.

Common Invasive Species include:

- **Purple Loosestrife (*Lythrum salicaria*)** - This flowering plant crowds out native wetland plants and impacts native fish and wildlife.



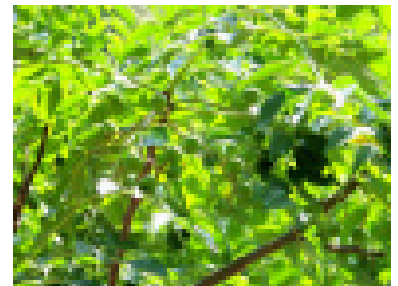
- **Water Hyacinth (*Eichornia crassipes*)** - Another deceptively beautiful flowering plant, Water Hyacinth is a fast growing aquatic that quickly displaces native vegetation.



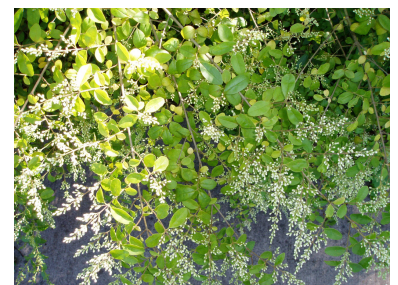
- **Alligatorweed (*Alternanthera philoxeroides*)** - Alligator weed can grow in dry or wet areas and is especially problematic in wetlands.



- **Chinese Tallow Tree/Popcorn Tree (*Triadica sebifera*)** - An ornamental tree that spreads quickly and is difficult to contain.



- **Chinese Privet (*Ligustrum sinense*)** - Chinese privet is problematic because of the large thickets which can develop and crowd out native species.



- **Japanese Honeysuckle (*Lonicera japonica*)** - A densely growing vine which can smother growing trees and shrubs.



- **Cogongrass (*Imperata cylindrica*)** - Cogongrass is not a wetland-specific plant but can also easily take over disturbed areas.



- **Johnsongrass (*Sorghum halepense*)** - Johnsongrass is not a wetland-specific plant but can also easily take over disturbed areas.



- **Kudzu (*Pueraria lobata*)** - Once used as ground cover to combat soil erosion, this vine has taken over the southeast.



- **Tropical Soda Apple (*Solanum viarum*)** - This invasive plant is commonly found in livestock grazing areas.



The unaltered buffer around the basin should be inspected for these plants annually during the growing season. Because of the fast growing rate of these species, they should be addressed as quickly as possible. There are several non-chemical methods of controlling invasive plant growth including plant removal, cutting and girdling. Limit use of pesticides and fertilizers in and around ponds to minimize entry into downstream waters. For assistance in finding the best approach to control invasive plants consult a professional vegetation/weed control specialist or contact the Mississippi State Extension Service.

Mississippi State University
Extension Service Madison
County

Phone: 601-859-3842

Embankment Stabilization

Failed side slopes of the embankments can be one source of retention/detention pond failure. It is very important for these side slopes to be covered by vegetation and ground cover for slope stabilization. Any unvegetated areas should be re-vegetated immediately to avoid unnecessary erosion and damage to the embankments. This simple step will save pond owners significant repair costs that could occur in the future if the embankments are not stabilized. If embankment erosion or failure occurs, contact a licensed design professional.

Schedule of Maintenance

The following table provides a schedule of maintenance for retention and detention basins. This schedule is a guideline for inspections and basin management strategies. The frequency of maintenance provided is only a guideline; each basin is different and may require more frequent maintenance.

Task	Schedule	Completion Date
Removal of trash and debris from basin waters, outlet structures and green space buffers.	Monthly	
Inspect outlet structure, inlet, spillways, etc. for structural condition. Replace or repair damages as needed.	Bi-annually	
Inspect inlet and outlet structures for trash, debris, and oily sheen (or other evidence of oil, grease or other automotive fluid).	Bi-annually	
Inspect vegetation in and around basin for invasive species and nuisance insect/wildlife.	Monthly	
Inspect side slopes, spillway and berms for erosion annually or after significant rain events (50 year storms).	Annually	
Maintain green space buffers with periodic mowing. (The vegetation surrounding the basin should be kept in a natural state. Periodic mowing or burning will assist in invasive species control.)	Annually	
Inspect for sediment build up at inlet structures, riprap/stone energy dissipaters, catch basins upstream and emergency spillway.	Annually	
Removal of sediment (frequency will depend on basin engineering specifics.) The basin structure should be re-built to its original design specifications.	Every 2-10 years	
If changes have occurred in the surrounding areas to effect water infiltration rates (such as increase impervious surfaces), an engineer should be consulted to determine the effectiveness of the basin.	As needed	

