

Retention & Detention Basins

Inspection & Maintenance Guide

RETENTION VS. DETENTION BASINS

Retention basins, also known as “wet ponds”, are typically used for flood control in subdivisions and on commercial properties to decrease peak flows and slowly release collected rainfall runoff over a longer period to reduce local flash flooding. Wet ponds can also be designed for “extended” storage, which detains water evenly above the permanent pool storage and then released over 24 hours. Wet extended detention ponds consume less space while serving the same pollutant removal as typical wet ponds.

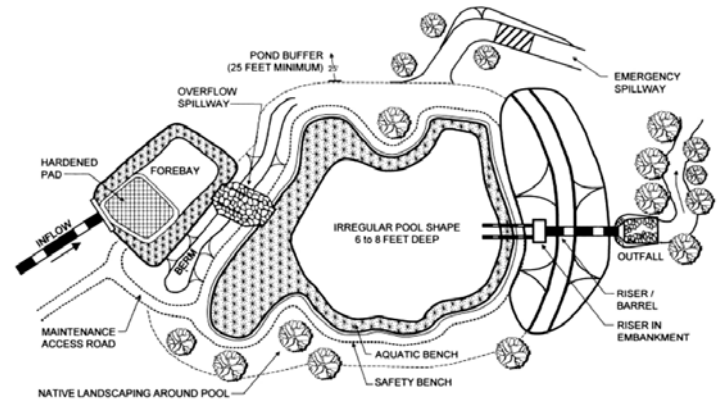
Detention basins, also known as “dry ponds”, capture stormwater runoff for a determined period of time after a storm event. Water is temporarily impounded in a dry pond and then discharged. Dry ponds typically feature low-flow concrete channels that convey temporary water to outlets and are often planted with turf grass or prairie species.

ROUTINE INSPECTIONS

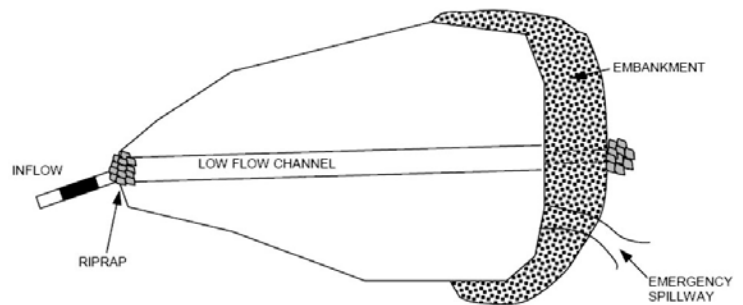
Maintenance is crucial to the long-term effectiveness (i.e. flood management) and aesthetics of detention and retention basins. Routine inspections of basins help determine if maintenance is required. Inspections should at a minimum be conducted annually by qualified staff or contractors. Obtain plan sets and review the design prior to inspection to be familiar with features. The following lists provide indicators that signal maintenance is needed for retention and detention basins.

RETENTION BASIN (WET POND)

- Sediment accumulation is visible near forebay
- Inlet, outlet, or forebay is blocked with debris
- Thick algal mats cover the surface of the pond and cause odor and aesthetic issues
- Single aquatic plant (such as cattails) are dominating the pond
- Visible damage to the embankment (i.e. significant erosion)
- Basin dam or buffer areas are over grown with trees or invasive species
- Water is overtopping riprap in normal conditions
- Beavers are present in the plunge pool



Wet Pond Example Schematic. Source: ISWMM



Dry Pond Example Schematic. Source: ISWMM

DETENTION BASIN (DRY POND)

- Standing water in the bottom of the pond is present 72 hours after a rain event
- Wetland vegetation emerges in non-marsh or wetland areas
- Inlet, outlet, or forebay is blocked with debris
- Visible damage to the embankment (i.e. significant erosion)
- Inlets or forebay is blocked by trash, sediment, or debris
- Scour areas outside of trickle ditches



RETENTION & DETENTION BASIN MAINTENANCE

1 ROUTINE MAINTENANCE: MOWING & WEEDING

Turf grass in detention basins should be mowed regularly and include weed and tree management. Native plants will need periodic mowing, grazing or prescribed burns along with weed control. Embankments on retention basins should be mowed at least twice during the spring and fall and once during the summer. Grass should be mowed to a height between 4 and 9 inches tall. Large woody vegetation that may impede flow into the basin or compromise the integrity of a structural component should be removed immediately. Refer to "Pull It or Keep It" Native Plants and Weed Field Guide for identifying invasive species.



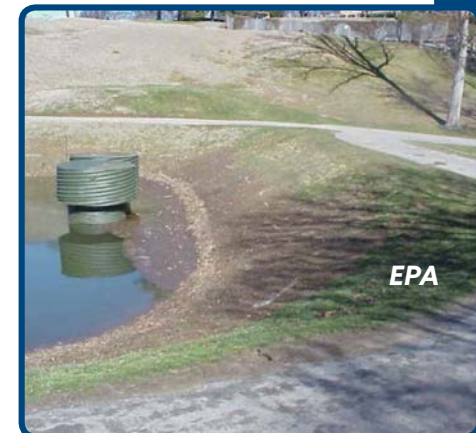
2 DEBRIS & LITTER CONTROL

Regular removal of debris and trash can maintain the aesthetics of the basin and reduce conditions suitable for algal growth. Ensure that inlets, outlets, and emergency overflow structures are not clogged and remove blocking materials if necessary.



3 STABILIZATION

Bare spots on banks that have eroded over time should be raked, backfilled, covered with topsoil, seeded and covered with mulch or erosion control blankets. Eroded areas near inlets and outlets need to be repaired using the same methods or include more durable armoring. Many retention basins are designed with a "no-mow" area along the perimeter of the basin, which should be maintained by removal of invasive species by hand or with hand tools. Riprap that has significantly shifted over time or is consistently below the permanent pool line should be replaced or adjusted.



4 INSECT & ANIMAL CONTROL

For detention basins, the best practice for controlling undesirable insects is to ensure that stagnant pools of water do not develop. Stocking a retention basin with fish can help control mosquito larvae. Prompt removal of debris can also limit breeding populations in both dry and wet ponds. Burrowing animals can deteriorate the structural integrity of outlet structures. Inspect outlets for signs of cracking, sink holes, and undercutting, which may be exacerbated by animals. Contact a professional engineer if these signs are present as remediation of the structure may be necessary.



5 MAJOR REPAIRS: SEDIMENT REMOVAL

Detention basins should be dredged every 2 to 10 years while sediment from retention basins should be removed every 5 to 15 years. An assessment of sediment depths should be completed to determine loss of storage depth. A minimum water depth of 3 feet is recommended for retention ponds. Detention basins should be cleared once 25 to 50 percent of the volume of the pond has been filled.

