

Water Quality Pond Maintenance Guidelines

Maintenance is extremely important in order for water quality and/or detention ponds to function properly. Accumulated sediment, debris and excessive plant growth can create pooling and prevent proper flow of storm water through the pond. Regular maintenance can prevent more serious problems that can be very costly to fix. A well maintained pond is more attractive and best serves its intended purpose(s) - water quality and/or flood protection.

To verify that your ponds are performing properly, inspect them regularly. In general, ponds should be inspected after all large storm events and once a month to determine what maintenance may be necessary. At a minimum, an inspection report is required to be submitted to the City at least twice annually. Failure to do so - and the failure to properly maintain ponds - may subject the property owner to fines for non-compliance.

In no case should storm water ponds be used to dispose of waste materials or swimming pool water.

Types of Ponds

Detention Ponds – Open structures that are designed to slow down storm water runoff. Water is detained for a short period (usually in terms of hours) and then slowly discharged from the pond. Their primary purpose is to prevent flooding. They provide very little treatment of pollutants.

Sedimentation/Filtration Ponds – Basins designed to filter storm water runoff through a layer of sand before being discharged to the storm sewer system or a creek. The sand captures pollutants such as sediment, heavy metals and oil. Because of the potential for clogging, these structures require an initial settling basin (a *Sedimentation Pond*) that prevents some of the larger materials from entering the sand filter.

Wet Ponds – A retention pond that contains a permanent pool of water. Planted with aquatic plants, they are more effective than filtration ponds at removing nutrients associated with landscape chemicals.

Bioretention – Basins that function as a soil and plant-based filtration device. They normally consist of a grass buffer strip, infiltration bed, ponding area, mulch layer, planting soil, and plants. Filtration of the stored water into the underlying soils occurs over a period of two days.

Filter Strips – Vegetated filter strips (natural and engineered) are densely vegetated sections of land designed to accept runoff as overland sheet flow. Dense vegetative cover facilitates conventional pollutant removal through detention, filtration by vegetation, and infiltration.

Further reference regarding water quality ponds and their maintenance can be found in the LCRA Highland Lakes Watershed Ordinance.

Maintenance

Detailed inspection reports are required to be submitted to the City at least twice annually. At least one of these inspections should be during or immediately following a rain event. Detailed inspections should be performed by an engineer or other storm water treatment professional. Any deficiencies identified during an inspection should be repaired immediately. The following maintenance guidelines should be followed.

General Site Maintenance

1. Identify, replant, and restore eroded areas. Add a level spreader, energy dissipation, or other repairs as required to ensure erosion does not reoccur.
2. Identify areas that do not have acceptable vegetated covers. Reseed, add soil, and irrigate as required to ensure that coverage requirements are met.
3. Mow sites twice annually and as required to keep grass height under 18-inches. Additional mowing may be performed for site aesthetics. Export the clippings from the site to prevent the release of nutrients from decaying plant matter. Remove any woody growth, especially from embankments, berms, and swales. For swales, grass should not be mowed below 4-inches in height.
4. Use non-chemical methods for maintaining health of vegetation. Pesticides, herbicides, or fertilizers should only be used as a last option, and then as minimally as possible. Fertilizer should rarely be required because runoff will typically contain sufficient nutrient loads.
5. Irrigation may be required in order to maintain acceptable levels of vegetated coverage, especially for engineered vegetated strips.
6. Never deposit grass clippings, brush, or other debris in ponds or buffers.
7. Prevent over-compaction of pond components that rely partially or wholly on infiltration treatment (vegetation strips, bioretention bed, infiltration trenches and basins). Mowing and other maintenance should be performed with hand equipment or a light-weight lawn tractor.
8. Remove any built-up sediment and debris, especially along uphill edges, berms, swales, level spreaders, and around inlets and outlets.
9. Identify any other problems.

Maintenance requirements for ALL water quality basins:

1. Have sediment removed from forebays and water quality basins whenever it reaches 10% of volume (typically 3-6 inches), or if it impedes flow through the pond resulting in standing water or decreased performance, or if there are signs of sediment erosion and re-suspension. At a minimum, remove sediment from the sediment forebay every 7-10 years and from the primary basin every 15 years.
2. Have sediment removed from top of bioretention beds, sand filters, infiltration trenches, and infiltration basins whenever and wherever it exceeds 1" in depth, or whenever design drawdown time is exceeded.
3. Remove sediment from inlet and outlet works of ponds whenever it reaches 3" in depth or negatively impacts performance.

4. Remove sediment from under-drains as required to ensure that they do not restrict flow through the pond. If condition of under-drains cannot be visually verified, they should be cleaned at least every 5 years.
5. Maintain access roads so that vehicles and equipment can reach all areas of the pond. Ensure that the entire outer perimeter is kept clear and accessible.
6. Remove debris and litter from site, especially at inlet and outlet works.
7. Identify and repair any structural damage including repairing cracked concrete, sealing voids, and removal of vegetation from cracks and joints.
8. Identify and repair any subsidence, leakage, and cracking along pond embankments.
9. Evaluate for nuisances (insects, weeds, odors, algae, etc.) particularly in areas of permanent standing water. If standing water is not part of the pond design, then the pond should be repaired to improve drainage. If standing water is required (i.e. wet pond, wetland) or desirable for aesthetics, then use non-chemical solutions whenever possible to remove nuisances. Fish such as flathead minnow are recommended for control of algae and mosquitoes.
10. Treat or replace any diseased vegetation. Replace any dead vegetation. For wet ponds and wetlands, multiple plantings may be required before a viable mix of plant-life is found.

Pond Specific Requirements:

1. **Sand Filters:** Replace top layer of sand filter as required to ensure that design drawdown time is not exceeded.
2. **Bioretention:** Add mulch where required to maintain 2”-3” thick layer at locations where ground vegetation is not present. Mulch layer should be replaced every 2-3 years. If bioretention incorporates sand filter overflows, then maintain per sand filter criteria.
3. **Retention/Irrigation:** Inspect and test operation six times annually, at least twice immediately following wet weather. Immediately repair any leaks, broken spray heads, or other malfunctions. Remove sediment from sump when it reaches 3 inches or impacts pump performance. Trim vegetation so that it does not interfere with irrigation equipment.
4. **Infiltration Trench:** Assess drawdown time using observation well. Scarify or remove and replace top filter layer of trench, as required to ensure design drawdown times. If complete rehabilitation is necessary, remove all stone and remove sediment deposited in base of trench. Till bottom of trench and wash and replace stone.
5. **Infiltration Basin:** Scarify infiltration surface with a hand-guided rotary tiller or light-weight lawn tractor with tiller, as required to ensure design drawdown times.
6. **Wet Basins:** If basin is designed with a permanent pool, ensure that water levels are sufficient to maintain aquatic habitat during dry months. Provide supplemental water if required.

Basin Dewatering

A common sign of failure of some permanent ponds is standing water long after the rain event ends. This is especially true in sand filters, dry extended detention basins, and retention basins. In addition, wet ponds may also need to be drained for maintenance purposes. The water in each of these systems can be

pumped into the storm water conveyance system downstream of the pond as long as it has been at least 24 hours since the last rain event. This delay provides sufficient time for most of the pollutants to settle out of the standing water. Even more appropriate is to discharge basin water onto a vegetated area that is capable of providing filtering and infiltration. The discharge should be conducted in a sheet flow manner to prevent erosion of the vegetated area.

Sediment Disposal

The maintenance of ponds frequently requires the disposal of accumulated sediment and other materials. These materials may normally be classified as special wastes when disposed of in municipal landfills. Contact the landfill or waste disposal service in advance for their specific waste acceptance requirements.

Inspection Forms

Inspection forms providing information similar to the following example forms should be submitted to the City of Lakeway (dependent upon the type of pond the site utilizes – a structural pond or a vegetative pond). If the site utilizes both types of ponds, an inspection form for each should be completed and submitted to the City.