

LOT 23 STORMWATER TREATMENT PROJECT MANAGEMENT PLAN

NOTES:

- Always keep detailed, written records for this site pertaining to all inspection visits, maintenance needs and work completed for future reference.
- If you are unsure whether a problem exists, please contact Greg Roseboom, WMU Utilities Manager at (269)207-6675
- Keep a 100ft buffer strip around detention basin where possible
- Within this buffer strip, mowing is only allowed for purposes of encouraging native diversity, controlling weeds or access to infrastructure
- Within this buffer strip, only low volume herbicides without a surfactant can be used. This type of herbicide can only be used for spot treatments of nuisance vegetation. Spray or broadcast treatments are not allowed within the buffer strip. No other chemical treatments are allowed within the buffer strip.

MONTHLY

REMOVE TRASH AND DEBRIS (LANDSCAPE SERVICES)

(monthly or more frequently as needed)

- Inspect the slow release discharge pipe in the wetpond. Clear any trash or accumulated sediment away from the pipe inlet if observed.
- Remove any yard waste (leaves, branches, dead plants), trash or debris from the wetpond outflow structure grate, forebay, berm and surrounding areas.
- Remove any floating debris within the sediment forebay and wetpond areas.

EROSION INSPECTIONS (LANDSCAPE SERVICES)

- Check for burrowing animals, as these pose a threat to long-term berm integrity. If discovered, remove the burrowing animals, replace all disturbed berm soils, and re-seed.
- Inspect the interior forebay berm for any signs of erosion rills or gullies that could develop. If necessary, place additional fill soils and reseed the filled area.

- Inspect all berms for signs of erosion rills or gullies that could develop into larger problems on the berms and emergency spillway. Place additional fill soils, and/or erosion mats and reseed the filled areas. Prompt repairs may be required in some cases.
- During the initial growing season (May-September 2010), inspect the vegetated swale entering the wetpond for any signs of erosion rills or gullies that could develop into larger problems. If erosive conditions are observed, place additional fill soils and reseed the filled areas.
- Conduct inspections of the vegetated swale. Look for any damage caused by wheeled traffic utilizing the access drive. Place additional fill soils and reseed the filled area if necessary.

MOWING (LANDSCAPE SERVICES)

(monthly or more frequently as needed to maintain access)

- Mow a one-mower edge width strip around the perimeter of the berm to improve accessibility and aesthetics.
 - Trim mow (weed whip) around hardscapes where needed for safety and access.
 - Trim mow (weed whip) around trees and bushes when appropriate to promote establishment.
- **Note – cuttings are not to be blown into detention areas. When mowing on the inside of the berm (near pond), excessive plant material should be removed to prevent it from entering the detention basin.

SPRING

VEGETATION MAINTENANCE (LANDSCAPE SERVICES)

- During mid-spring of 2010 and 2011, mow all vegetation to ground level in order to reduce the annual plants and woody vegetation and encourage warm season natives.
- In the spring of 2012, conduct a plant inventory and create management areas based on the species mix that dominates each area. Encourage diversity and microhabitats through varying mowing times in spring, summer and fall. Update the management plan, accordingly.
- Conduct a plant inventory to document and ensure plants are establishing well at the site. Evaluate health, abundance and diversity of native plants. Compare to planting lists. Make note of any wildlife observed.
- Supplement with additional native regional plants/plugs/seeds as needed if significant plant mortality (due to erosion, mechanical damage, natural causes etc...) has occurred.
- Perform weeding of non-desirable species (invasive or exotic) before they produce and release seeds by selective mowing, cutting, and/or hand removal techniques. Routine, weeding will assure a diversity of native vegetation and will allow for dense establishment.

MAINTENANCE INSPECTIONS (FACILITIES MANAGEMENT)

- Inspect the ground surface of the piping run between the diversion structure and the sediment forebay inlet for any signs of slope instability or groundwater seeping. This piping run was anchored into the slope using metal stakes and rebar (every 5 feet) to prevent pipe movement. Any signs of slope instability should be documented and discussed with a Professional Engineer.
- Inspect wetpond berms to identify repair and maintenance needs.
- Inspect the outer toe of the pond berms. If there are wet areas or seeps at the outside toe of the berm, it could be an indication of a serious problem. Seek assistance from a Professional Engineer to evaluate any suspected seepage.
- Conduct spot elevation checks on the top of all perimeter berms at least semi-annually during the first two years to observe and correct for any potential settlement. Following the first two years, conduct spot elevation checks as needed to verify any visual appearance of berm settling. Top of berm elevations should be within 0.25 feet (or 3 inches) of the 837.5 feet design elevation. Settlement of the berms can result in a loss of freeboard and may increase the risk of a berm failure in the future if not addressed.
- Conduct inspections of the concrete swale for signs of cracks, displacement, spalling, or settling. Implement repairs if these or other concerns are present.
- Conduct inspections of the drainage spillway for any signs of erosion, settling or cracking. Repair any observed concerns to ensure long-term stability.
- Inspect for sediment accumulation within the forebay. Remove accumulated sediment when it reaches 6-inch depth, or if accumulation is causing the outlet stone to become compromised by potential for clogging.
- Inspect the entire southern berm toe along the former parking lot curb. Ensure that the remaining curb is capable of draining berm runoff and direct rainfall via the two existing curb cut spillways. Note any signs of undercutting along the entire length of the remaining curb.

SUMMER

VEGETATION MAINTENANCE (LANDSCAPE SERVICES)

- Conduct a plant inventory. Evaluate health, abundance and diversity of native plants. Make note of any wildlife observed.
- Supplement with additional native regional plants/plugs/seeds as needed if significant plant mortality (due to erosion, mechanical damage, natural causes etc...) has occurred.
- Perform weeding of non-desirable species (invasive or exotic) before they produce and release seeds by selective mowing, cutting, and/or hand removal techniques.

MAINTENANCE INSPECTIONS (FACILITIES MANAGEMENT)

- Inspect the ground surface of the piping run between the diversion structure and the sediment forebay inlet for any signs of slope instability or groundwater seeping. This piping run was anchored into the slope using metal stakes and rebar (every 5 feet) to prevent pipe movement. Any signs of slope instability should be documented and discussed with a Professional Engineer.
- Inspect wetpond berms to identify repair and maintenance needs.
- Inspect the outer toe of the pond berms. If there are wet areas or seeps at the outside toe of the berm, it could be an indication of a serious problem. Seek assistance from a Professional Engineer to evaluate any suspected seepage.
- Inspect the concrete/masonry condition of the wetpond outflow structure annually for signs of cracks, displacement, spalling, joint failures, and water tightness, Implement repairs if these or other concerns are present.
- Inspect the entire southern berm toe along the former parking lot curb. Ensure that the remaining curb is capable of draining berm runoff and direct rainfall via the two existing curb cut spillways. Note any signs of undercutting along the entire length of the remaining curb.

FALL

VEGETATION MAINTENANCE (LANDSCAPE SERVICES)

- Conduct a plant inventory. Evaluate health, abundance and diversity of native plants. Make note of any wildlife observed.
- Perform weeding of non-desirable species (invasive or exotic) before they produce and release seeds by selective mowing, cutting, and/or hand removal techniques.

MAINTENANCE INSPECTIONS (FACILITIES MANAGEMENT)

- Inspect the ground surface of the piping run between the diversion structure and the sediment forebay inlet for any signs of slope instability or groundwater seeping. This piping run was anchored into the slope using metal stakes and rebar (every 5 feet) to prevent pipe movement. Any signs of slope instability should be documented and discussed with a Professional Engineer.
- Inspect wetpond berms to identify repair and maintenance needs.
- Inspect the outer toe of the pond berms. If there are wet areas or seeps at the outside toe of the berm, it could be an indication of a serious problem. Seek assistance from a Professional Engineer to evaluate any suspected seepage.

- Conduct spot elevation checks on the top of all perimeter berms at least semi-annually during the first two years to observe and correct for any potential settlement. Following the first two years, conduct spot elevation checks as needed to verify any visual appearance of berm settling. Top of berm elevations should be within 0.25 feet (or 3 inches) of the 837.5 feet design elevation. Settlement of the berms can result in a loss of freeboard and may increase the risk of a berm failure in the future if not addressed.
- Conduct inspections of the concrete swale for signs of cracks, displacement, spalling, or settling. Implement repairs if these or other concerns are present.
- Conduct inspections of the drainage spillway for any signs of erosion, settling or cracking. Repair any observed concerns to ensure long-term stability.
- Inspect for sediment accumulation within the forebay. Remove accumulated sediment when it reaches 6-inch depth, or if accumulation is causing the outlet stone to become compromised by potential for clogging.
- Inspect the entire southern berm toe along the former parking lot curb. Ensure that the remaining curb is capable of draining berm runoff and direct rainfall via the two existing curb cut spillways. Note any signs of undercutting along the entire length of the remaining curb.

WINTER

MAINTENANCE INSPECTIONS (FACILITIES MANAGEMENT)

- Inspect the ground surface of the piping run between the diversion structure and the sediment forebay inlet for any signs of slope instability or groundwater seeping. This piping run was anchored into the slope using metal stakes and rebar (every 5 feet) to prevent pipe movement. Any signs of slope instability should be documented and discussed with a Professional Engineer.
- Inspect wetpond berms to identify repair and maintenance needs.
- Inspect the outer toe of the pond berms. If there are wet areas or seeps at the outside toe of the berm, it could be an indication of a serious problem. Seek assistance from a Professional Engineer to evaluate any suspected seepage.
- Inspect the entire southern berm toe along the former parking lot curb. Ensure that the remaining curb is capable of draining berm runoff and direct rainfall via the two existing curb cut spillways. Note any signs of undercutting along the entire length of the remaining curb.

FOLLOWING A LARGE STORM EVENT OR INTENSE FLOWS

MAINTENANCE INSPECTIONS (FACILITIES MANAGEMENT)

- Inspect the riprap apron of the forebay inlet for any signs of erosion. Replace any riprap that may become displaced. If holes occur in filter fabric (beneath the riprap), repair immediately by overlaying damaged fabric with new material and replacing riprap or other erosion resistant material consistent with the original design.
 - Inspect the stone materials of the forebay outlet for displacement. Repair any signs of erosion at the forebay outlet.
 - Inspect the outflow grate to ensure it is not obstructed. Obstructions on the top grate of the wetpond outflow structure will cause the emergency spillway to become the primary exit for pond outflow during large, prolonged storms. The emergency spillway is not intended for routine outflow conditions, but rather for emergency situations only.
 - Inspect wetpond berms after significant storm events (2 inches or greater) to identify repair and maintenance needs.
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