

Maintenance Considerations

Structural stormwater BMPs require regular maintenance to perform successfully. Failure to perform adequate maintenance can lead to reductions in pollutant removal efficiency or increase pollutant loadings and aggravate downstream impacts. Stormwater BMPs should be routinely inspected and maintained following construction to ensure that the controls are in proper working condition and operating as designed.

BMP Design Considerations to Reduce and Facilitate Maintenance

Effective design of stormwater BMPs can reduce maintenance requirements and help facilitate routine maintenance activities, which can improve the long-term operation and function of the BMP. General design recommendations to reduce and facilitate BMP maintenance include:

- Identify the parties responsible for conducting long-term inspections and maintenance and develop BMP designs that align with their operation and maintenance capabilities.
- Place inlet/outlet structures along the perimeter of the stormwater BMP for easier access.
- Place a 4-foot high (minimum) flexible delineator post adjacent to infrastructure that may become hidden and can potentially become a safety hazard (e.g., trip and fall), may be damaged during maintenance, or may damage maintenance equipment. Examples include inlet structures, clean-outs, observation wells, and raised outlet structures.
- Identify adequate space to stage maintenance activities and equipment. Consider parking lot use and on-street parking limitations when identifying this area. Access paths can also serve as a staging area for equipment during maintenance.
- Consider the weight of the maintenance equipment and portable weight displacement tracks/plywood. Equipment should not adversely impact the functionality of the stormwater BMP (i.e., compacting the subsurface soil media). For instance, not relying on sediment removal equipment (e.g., excavator) accessing surfaces where water infiltrates as well as ensuring that surfaces to be mowed by larger mowing equipment can withstand typical tire pressures from such equipment.⁶⁴
- Designate safe entry and exit points to the stormwater BMP; design to allow for safe approach and exit speeds for BMPs near roads.
- Consider existing and proposed barriers (e.g., guardrail, fence, etc.) that may hinder access to the BMP. Provide a gap, gate, etc. in the barrier accordingly.
- Provide the appropriate level of access to the varying components of the stormwater BMP. For instance, it is necessary to provide vehicular access to the BMP, but it may only be

⁶⁴ Strategies for mitigating these impacts can be found in the [Soil Erosion and Sediment Control Guidelines](#)

necessary to provide access for mowing equipment to the vegetated portions within the BMP.

- At a minimum, the access path should abut pretreatment facilities and provide safe access to all points that require routine maintenance or sediment removal. Consider the equipment type and any limitations including excavator reach and vacuum truck hose length. Also consider vegetation that may limit access, such as shrubs that would hinder the use of a hose.
- Depict the access path on the figure that will be incorporated with the long-term operation and maintenance plan.
- Evaluate the potential for snow storage on the stormwater BMP. Sediment/debris that accumulates within the plowed snow may impact the effectiveness of the BMP after the snow melts and the sediment/debris remains.
- BMPs will need to withstand anticipated snow loads if plowed/shoveled snow is permitted to accumulate over the BMP.
- Use transition curbs or steel plates where curb cuts are proposed to limit the potential for damage from snowplows.
- Depict any snow storage areas on the figure that will be incorporated with the long-term operation and maintenance plan. In areas where snow storage is not permitted, identify these areas as well.
- Place the least expensive and most easily maintained components of a stormwater BMP treatment train at the most upstream point in the treatment train to reduce the maintenance requirements of the downstream components.

General Inspection and Maintenance Requirements

General maintenance guidelines for stormwater BMPs are summarized below. [Chapter 13 - Structural Stormwater BMP Design Guidance](#) provides recommended maintenance for specific stormwater BMPs. [Appendix B](#) contains BMP-specific maintenance inspection checklists.

- **Inspections.** Inspections should be performed at regular intervals to ensure proper operation of structural stormwater BMPs. Inspections should be conducted at least annually, with additional inspections following large storms. Inspections should include a comprehensive visual check for evidence of the following (not all items apply to every BMP type):
 - Accumulation of sediment or debris at inlet and outlet structures
 - Erosion, settlement, or slope failure
 - Clogging or buildup of fines on infiltration surfaces
 - Vegetative stress and appropriate water levels for emergent vegetation

- Algae growth, stagnant pools, or noxious odors
 - Deterioration of pipes or conduits
 - Seepage at the toe of ponds or wetlands
 - Deterioration or sedimentation in downstream channels and energy dissipators
 - Evidence of vandalism
 - Evidence of structural damage by beavers, muskrats, and other wildlife
- **Routine Maintenance.** Routine maintenance should be performed on a regular basis to maintain proper operation and aesthetics. Routine maintenance should include:
- Debris and litter removal
 - Silt and sediment removal
 - Terrestrial vegetation maintenance
 - Aquatic vegetation maintenance
 - Maintenance of mechanical components (valves, gates, access hatches, locks)
- **Non-routine Maintenance.** Non-routine maintenance refers to corrective measures taken to repair or rehabilitate stormwater BMPs to proper working condition. Non-routine maintenance is performed as needed, typically in response to problems detected during routine maintenance and inspections, and can include:
- Erosion and structural repair
 - Sediment removal and disposal
 - Nuisance control (odors, mosquitoes, weeds, excessive litter)

Stormwater BMP maintenance requirements are an integral part of a site stormwater management plan (see [Chapter 12 – Stormwater Management Plan](#)). These requirements should include, at a minimum, detailed inspection and maintenance tasks, schedules, responsible parties, and financing provisions. The owner typically maintains stormwater treatment practices at commercial, industrial, and rental residential developments. These facilities generally have staff dedicated to maintenance activities or contract for such services. Maintenance of non-rental residential installations is typically performed by private landowners or property/homeowner associations, which in many cases do not have the technical expertise, resources, or funds to inspect and maintain their stormwater systems. In some cases, municipalities may accept responsibility for inspecting and maintaining stormwater BMPs. Municipalities should require legally binding maintenance agreements for stormwater treatment practices to clearly delineate maintenance responsibilities.