700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

Stormwater Quality Maintenance Agreement Instructions

Louisville & Jefferson County MSD administers regulations requiring post-construction water quality best management practice (BMP) installation for developments disturbing one acre or more in accordance with their Municipal Separate Storm Sewer System permit requirements to establish and enforce a water quality treatment standard and to promote clean, safe waterways in our community.

Sites with BMPs are required to enter into a long-term Stormwater Quality Maintenance Agreement (SWQMA) with MSD regarding the inspection and maintenance requirements for the BMPs. Below is a list of instructions for completing the agreement:

1. **Project Scope** - Complete the Water Management number assigned to the project by your reviewer. On the provided lines, for each BMP, select the type from the dropdown list, enter the latitude and longitude. For proprietary products only, list the manufacturer and model.
2. **Exhibit A** - Exhibit A is the maintenance schedule for the proposed post-construction water quality BMP(s). The maintenance schedules can be found on the following pages. Print and include the appropriate maintenance schedule(s) for each type of proposed BMP included in the development on 8.5"x11" sheets of paper.
3. **Signature must be completed by the Owner or Authorized Officer** – If signing on behalf of an authorized officer of a corporation or organization, an MSD Corporate/Organization Resolution Certificate must be submitted with documents.
4. **Mail or drop off the original signed copy of the agreement** to your Project Plan Reviewer at 700 West Liberty Street, Louisville, KY 40203.

Completing the Annual Inspection:

- **Annual Inspection Checklists for each BMP are due July 1st** beginning the year following release of the Site Disturbance Permit for the project. Inspection checklists are available at www.louisvillemsd.org for each type of BMP.

- **Required annual inspections of BMPs must be completed by a Qualified Post-Construction Inspector (QPCI).** QPCI training and certification is provided free of charge on the MSD website. If requested, MSD can assist the Property Owner in preparing the first annual inspection checklist(s).

For questions or comments related to maintenance and inspections please email MSDMS4@louisvillemsd.org or contact the MS4 department at (502) 540-6000.

Exhibit A
BMP Maintenance Schedules

The following maintenance schedules are from the MSD Design Manual Chapter 18, effective 6/30/2021 and reproduced here for convenience. Please print **ONLY** the applicable BMP Maintenance Schedule(s) on an 8.5x11 sheet(s) of paper.

Effective: 06/30/2021

Exhibit A
BMP Maintenance Schedules
Bioretention

Table 18.16 Bioretention (Rain Garden, Bioswale or Planter Box) Maintenance Schedule	
Schedule	**Activity**
As needed	• Water as recommended by the nursery during establishment and then as needed during dry conditions
At least 3 times per year	• Prune and control weeds • Remove and replace dead or damaged vegetation • Mow perimeter areas as needed
Semi-annually in spring and fall	• Remove sediment, trash and debris from inlets/forebays • Inspect inflow points for clogging and remove any sediment • Inspect for erosion, rills or gullies and repair • Herbaceous trees and shrubs should be inspected to evaluate their health and remove any dead or severely diseased vegetation • Remove fallen, clipped or trimmed plant material from rain garden to prevent clogging and replace dead plants • Develop/adjust vegetation maintenance plan for trimming and dividing perennials (if applicable) to prevent overcrowding and stress and to achieve desired aesthetic qualities; remove any non-native, invasive species • Inspect vegetation for health and signs of stress; if vegetation begin showing signs of stress, including drought, flooding, disease, nutrient deficiency, insect attack or improper mowing, treat the problem or replace the plants • Observe infiltration rates after rain events; bioretention BMPs should drain within 36 hours of a storm event • A mulching depth of about 2-3 inches should be inspected and obtained, and additional mulch should be added if necessary • Evaluate areas containing low flow stone or gravel; replace if necessary
Upon failure	• Replace/repair inlets, outlets, scour protection or other structures as needed • Replace vegetation as needed to align with original planting plan • If the rain garden is not meeting desired infiltration rates or over time soil has compacted, check soil infiltration rates by performing a percolation test • Re-aerate or replace soil and mulch layers as needed to achieve infiltration rate of 0.5 inches per hour • When removing soil for replacement, take to landfill or soil recycling center

Table 18.17 Constructed Wetland Maintenance Schedule	
Schedule	**Activity**
Quarterly during the first growing season	• Remove and replace dead, severely diseased vegetation, or damaged plants • Remove or control weeds and invasive species • Monitor wetland after major storm events to ensure structures are functioning properly and inspect for erosion
Semi-annually in spring and fall	• Inspect inflow points for clogging • Inspect for erosion, rills or gullies along the embankments and repair • Remove fallen, clipped, or trimmed plant material from wetland to prevent outlet clogging • Harvesting of seasonally dead plant material in the fall may be needed if high nutrient level treatment is desired • Inspect vegetation for health and signs of stress; if plants begin showing signs of stress, including drought, flooding, disease, nutrient deficiency, insect attack or improper mowing, treat the problem or replace the plants • Observe water levels to confirm that they are as designed • Mow maintenance access areas around wetland • Maintain signs in “no mow” areas
Annually or as needed	• Remove sediment, trash and debris from inlets/forebays when one-quarter of the forebay volume has been lost
5 plus years or upon failure	• Monitor sediment accumulation and remove when one-quarter of the constructed wetland’s design volume has been lost • Dredge sediment to meet original design volume and replace vegetation as needed to align with original planting plan

Exhibit A
BMP Maintenance Schedules
Green Wet Basin

Table 18.18 Green Wet Basin Maintenance Schedule	
Schedule	**Activity**
Monthly during the first growing season	• Remove and replace dead or damaged plants • Remove or control weeds and invasive species • Inspect and repair erosion • Water as needed to keep plants alive
Semi-annually in Spring and Fall	• Inspect inflow/outflow points for clogging • Remove any trash and debris • Inspect for erosion, rills or gullies along the embankments and repair • Vegetation should be inspected to evaluate their health and remove any dead or severely diseased vegetation • Remove fallen, clipped or trimmed plant material from basin to prevent outlet clogging • If plants begin showing signs of stress, including drought, flooding, disease, nutrient deficiency, insect attack or improper mowing, treat the problem or replace the plants • Inspect for plant root damage due to piping and mammal burrows; remove/repair when discovered • Mow maintenance access areas around green wet basins; do not mow buffer area around basin • Clean pond and forebay of debris and trash
Annually	• Remove sediment from inlets/forebays when one-quarter of the forebay volume has been lost
5 plus years or upon failure	• Monitor sediment accumulation and remove when one-quarter of the green wet basin's design volume has been lost • Dredge sediment to meet original design volume and replace vegetation as needed to align with original planting plan

Exhibit A
BMP Maintenance Schedules
Green Dry Basin

Table 18.19 Green Dry Basin Maintenance Schedule	
Schedule	**Activity**
Monthly during the first growing season	• Remove and replace dead or damaged plants • Remove or control weeds and invasive species • Inspect for erosion • Water as needed to keep plants alive
Semi-annually in spring and fall	• Inspect inflow/outflow points for clogging • Remove any trash and debris from forebay • Inspect for erosion, rills or gullies along the embankments and repair • Vegetation should be inspected to evaluate their health and remove any dead or severely diseased vegetation • Remove fallen, clipped or trimmed plant material from basin to prevent outlet clogging • If plants begin showing signs of stress, including drought, flooding, disease, nutrient deficiency, insect attack or improper mowing, treat the problem or replace the plants • Inspect for plant root damage due to piping and mammal burrows; remove/repair when discovered • Mow maintenance access areas around green dry basins • Green dry basins should drain within 36 hours of a storm event • Clean pond of debris and trash • Remove any sediment accumulation
Annually	• Remove sediment from inlets/forebays when one-quarter of the forebay volume has been lost
5 plus years or upon failure	• Monitor sediment accumulation and remove when one-quarter of the green dry basin's design volume has been lost • Remove sediment to meet original design volume and replace vegetation as needed to align with original planting plan

Table 18.20 Green Roof Maintenance Schedule (Extensive and Intensive Green Roofs)	
Schedule	**Activity**
As needed	• Water as recommended by the nursery during establishment and then as needed during dry conditions
Minimum 3 times during growing season	• Remove sediment, trash, weeds and debris • Implement landscaping maintenance plan for trimming to achieve desired aesthetic qualities • Mulch as needed • Inspect landscaping for health and signs of stress • If vegetation begins showing signs of stress, including drought, flooding, disease, nutrient deficiency or insect attack, treat the problem or replace the vegetation • Inspect underneath roof system • Drainage routes should be kept clear so that leakage is avoided and plants are not susceptible to increased moisture in the soil • Observe infiltration rates after rain events; green roof should drain within 24 hours of a storm event
Upon failure	• Replace green roof system

Exhibit A
BMP Maintenance Schedules
Permeable Pavement

Table 18.21 Permeable Pavement Maintenance Schedule	
Schedule	**Activity**
At least once per year	• Vacuum/water jet combination attachment • Replace aggregate between pavers as necessary (if applicable)
Monthly during the growing season	• Inspect the pavement for trash, debris and dirt • Keep weeds and grass out of the paved area (unless concrete grid pavers are being used) • Mow/trim adjacent vegetation and remove clippings and other debris from the area using a leaf blower • Visually inspect the pavement after large storms to ensure the overflow drainage system is working After cleaning, additional aggregate fill may need to be added and the pavers should be inspected for damage and repaired as needed
Semi-annually in spring and fall or as needed	• Sweep or vacuum the pavement with a street sweeper or street vacuum • If the pavement are installed in an area that is subject to higher than normal amounts of sediment (i.e. an area with large trucks traveling on it daily) it may need to be cleaned more often • Replace any joint material that may have eroded • Observe the system during a rain event • Areas should be routinely inspected for settling and loss of water flow through the system

As needed in winter	• Organic deicers may be used to melt ice and snow
	• Snow plows may be used when necessary under the following conditions:
	  ○ The edges of the plow are beveled
	  ○ The blade of the snow plow is raised 1 to 2 inches
	  ○ The snow plow is equipped with snow shoes which allow the blade to glide across uneven surfaces

Upon failure	• When the base layer becomes clogged, remove pavers or pavement and replace/repair base layer to achieve design infiltration volume/rate. Note: Chip stone aggregate may be used between paver joints to prevent complete failure

18.22 Tree Box Maintenance Schedule	
Schedule	**Activity**
As needed	• Water as recommended by the nursery during establishment and then as needed during dry conditions
Semi-annually in spring and fall	• Remove sediment, trash, weeds and debris • Implement vegetation maintenance plan for trimming to achieve desired aesthetic qualities • Inspect vegetation for health and signs of stress • If tree/shrub begins showing signs of stress, including drought, flooding, disease, nutrient deficiency or insect attack, treat the problem or replace the vegetation • Observe infiltration rates after rain events. The tree box should drain within 24 hours of a storm event • Replace mulching as needed, maintain at least 2-3 inches of mulch
10-25 years	• Remove tree/shrub and replace with smaller specimen

Table 18.23 Vegetated Buffer Maintenance Schedule	
Schedule	**Activity**
As needed	• Water as recommended by the nursery during establishment and then as needed during dry conditions • Trim vegetation in accordance with nursery recommendations
Semi-annually in spring and fall during first year and annually thereafter	• Inspect grading of vegetated buffer to ensure sheet flow across the entire buffer length and width • Inspect vegetation for health and signs of stress; if tree/shrub/grass begins showing signs of stress, including drought, flooding, disease, nutrient deficiency or insect attack, treat the problem or replace the vegetation • Inspect buffer for erosion and bare spots and repair
Following significant rain events (>10 yrs)	• Inspect and repair eroded or damaged areas to maintain sheet flow to and across the vegetated buffer

Table 18.24 Catch Basin Inserts Maintenance Schedule	
Schedule	**Activity**
Preventative measures	Inflow should flow through the filter system
Regularly and after Major Storm Events	Inspect catch basin inserts for clogging and remove sediment, trash or debris
Semi-annually in spring and fall	Visit site to ensure there is not excessive erosion or sediment flow upstream of the catch basin insert
As Needed	Replace catch basin inserts

Table 18.25 Proprietary Water Quality Units Maintenance Schedule	
Schedule	**Activity**
As needed	• Inspect drainage areas to proprietary WQUs for trash, erosion and debris • Perform cleanout if hazardous or foreign substances are spilled in the drainage areas • Repair inlets, outlets, control valves or other structural features as needed • Inspect system after major rain events to ensure it is draining properly
Quarterly	• Inspect system for blockage or sediment buildup and perform cleanout if necessary • Follow manufacturer's guidelines and develop/adjust maintenance plan for the system
Annually	• Perform cleanout of the system with vacuum or boom trucks • Clean any sediment or oil chambers • Inspect inlets, outlets and other structural features; repair as needed

Table 18.26 Infiltration Trench Maintenance Schedule (Open and Underground Storage)	
Open Storage	
Schedule	**Activity**
2-3 times per year as needed	• Monitor the drain observation well after large rain events and check for any ponding water • Mow or trim the perimeter of the practice and any pretreatment devices; grass clippings should be removed to prevent clogging • Check observation well for clogging
Semi-annually	• Check pretreatment systems and other structures for clogging; remove sediment and debris as necessary • Inspect the top layer of the trench for ponding water, leaves, grass clippings or other debris • Inspect any piping or other structural devices for damage and replace as necessary
Upon failure	• If the entire system becomes clogged, remove and install clean, double washed trench aggregate • It may also be necessary to replace piping, filter fabric, etc.
Underground Storage	
As needed	• Inspect drainage areas to BMP for trash, erosion and debris • Perform cleanout if hazardous or foreign substances are spilled in the drainage areas • Repair inlets, outlets, control valves or other structural features as needed • Inspect system after major rain events to ensure it is draining properly
Quarterly	• Inspect system for blockage or sediment buildup and perform cleanout if necessary
Annually or as needed	• Perform cleanout of the system with vacuum or boom trucks • Clean pretreatment device • Clean any trapped or sump manhole structures connected to system (if applicable) • Inspect inlets, outlets and other structural features; repair as needed
Upon failure	• When the base layer becomes clogged and no longer infiltrates at the design rate/volume, the subsurface will need to be removed and replace to achieve the design infiltration rate/volume Note: Pretreatment is required for the system to prevent complete failure