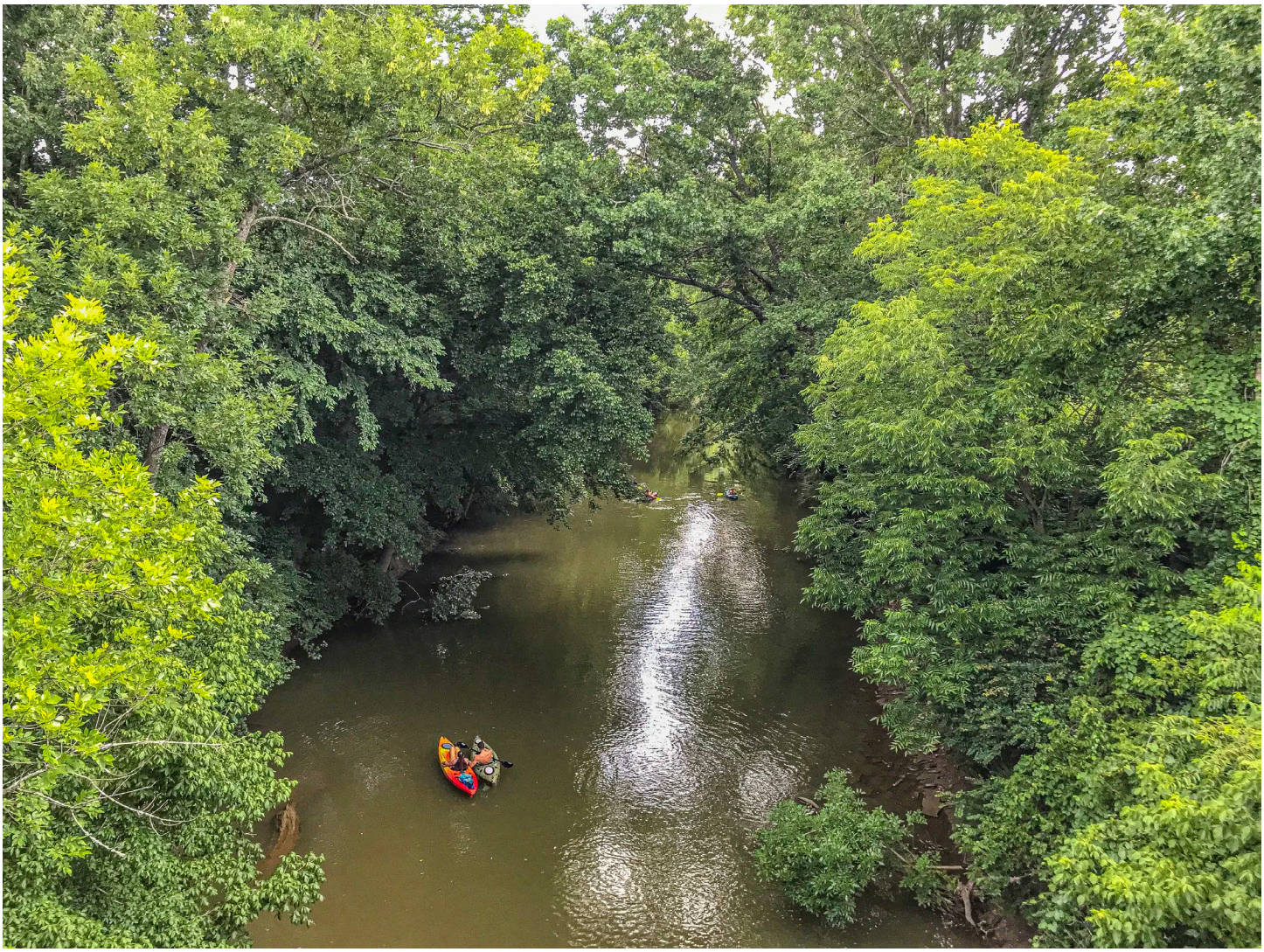

SCM Maintenance and Inspection Guide

City of Franklin Stormwater Management

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INTRODUCTION

The use of stormwater control measures (SCMs) has increased in recent years due to new stormwater regulations. These regulations also require local municipalities to develop a method to document and inspect the SCMs, also known as best management practices (BMP), to ensure all treatment measures are achieving their treatment goals and not causing flooding issues.

This guide can be used to help property owners who have these features onsite understand and identify the most common problems that can occur with some SCMs.

HISTORY

The Clean Water Act of 1977 provided a mandate for states to address sources of pollutants into surface waters. In the early years, the implementation of the Clean Water Act focused on controlling the pollution from point sources, such as factories and treatment plants. Now, efforts are focused on stormwater runoff, or nonpoint source pollution.

STORMWATER MANAGEMENT

Stormwater picks up many pollutants, such as sediment, fertilizer, pesticides, and bacteria (pet waste), and carry those pollutants to our streams and rivers. Stormwater flows much quicker across roads and other impervious surfaces than forest or fields. After development, stormwater runoff increases and can cause more instability in our streams. Figure 1 shows how development can increase the surface runoff.

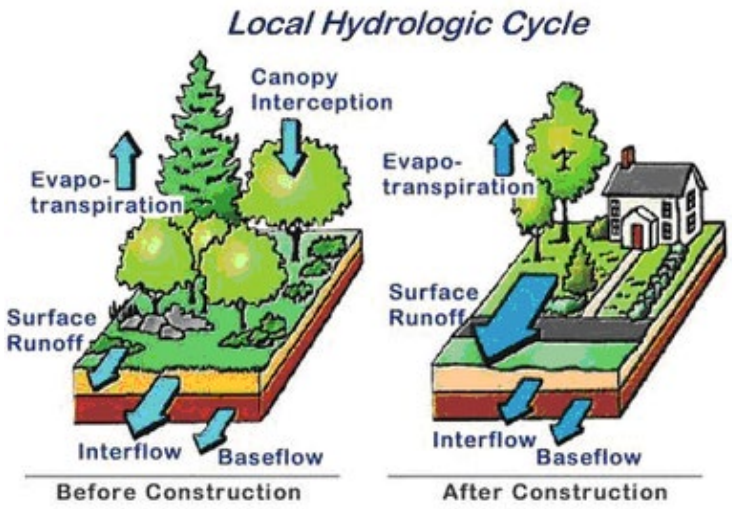


Figure 1

SCMS: WHAT DO THEY DO?

SCMs are engineered facilities that are designed to manage stormwater runoff. The goal of SCMs is to reduce the impact of development on downstream water resources by: minimizing the amount of stormwater runoff, slowing down the runoff, infiltrating the runoff, and filtering the runoff. Many SCMs utilize vegetation to help filter stormwater runoff and release runoff back into the atmosphere through evapotranspiration.

WHY MAINTAIN THESE?

When a developer finishes, maintenance responsibilities for the SCMs may be turned over to someone else, which could be the property owner, a nonprofit organization, the local municipality, an authority, a private corporation, or another person. The engineer will have produced a plan, also known as the Long-Term Maintenance Plan (LTMP) that must include drawings, which show the locations of each SCM on a property. Accompanying this LTMP will be a long-term operation and maintenance schedule, which provides for inspection of SCMs, including the repair, replacement, or other routine maintenance of the SCM to ensure proper function and operation. This maintenance program must describe how access will be achieved.

SCMs are at peak performance when they are inspected and maintained regularly. Since these features are designed to filter out pollutants, over time these areas fill with debris and sediment. The accumulation of pollutants decreases the function of the SCM. Regular inspection and maintenance is required to ensure the facility is fully functioning and not liable to cause flooding issues.

TYPES OF SCMS

STORMWATER PONDS

Stormwater ponds, also known as detention ponds, are constructed basins that are designed to capture and slowly release stormwater runoff to decrease downstream flooding and water quality issues.

DESCRIPTION

Stormwater ponds are one of the most utilized SCMs. They are typically located near the outfall of the site. The primary function of a stormwater pond is to capture sediment and other pollutants before flowing downstream. The act of slowly releasing the stormwater allows for sediment to settle out during the detention period.

Since these ponds are designed to temporarily store stormwater, most ponds use an outlet structure. These structures can take various forms and can be made of many materials. A typical outlet structure will provide multiple openings to allow for both small and large storms to be detained, see Figure 2 for an example.

Figure 2: A typical outlet structure

EXTENDED DETENTION (WET PONDS)

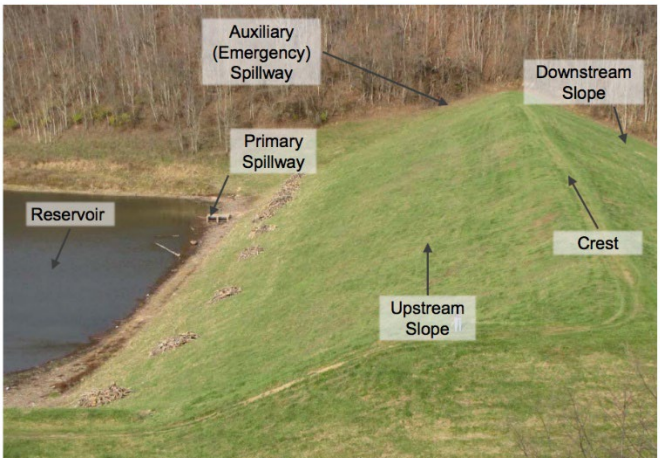


Figure 3: Typical components of a wet pond

Extended detention, or wet ponds, typically have a permanent pool area. Storage for storm events occurs above the permanent pool elevation. The permanent pool allows for settling of pollutants with the added benefit of being an attractive feature. Most wet ponds within Franklin are lined. Liners are used to separate surface water from groundwater and to help maintain the permanent pool in difficult site conditions.

DRY DETENTION (DRY PONDS)

Dry detention ponds have no permanent pool. Stormwater enters and exits a dry detention basin typically within 72 hours after a rain event. Stormwater is gradually released through an outlet structure.

DETAILED INSPECTION AND MAINTENANCE

EMBANKMENT AND EMERGENCY SPILLWAYS

The embankment (or emergency spillway) is also known as a dam. Below is a photo showing the embankment in a dry pond. The emergency spillway is a slightly lower area at the top of the embankment that allows for heavy flows to pass safely. The most common problem in these areas are erosion and unstable slopes.

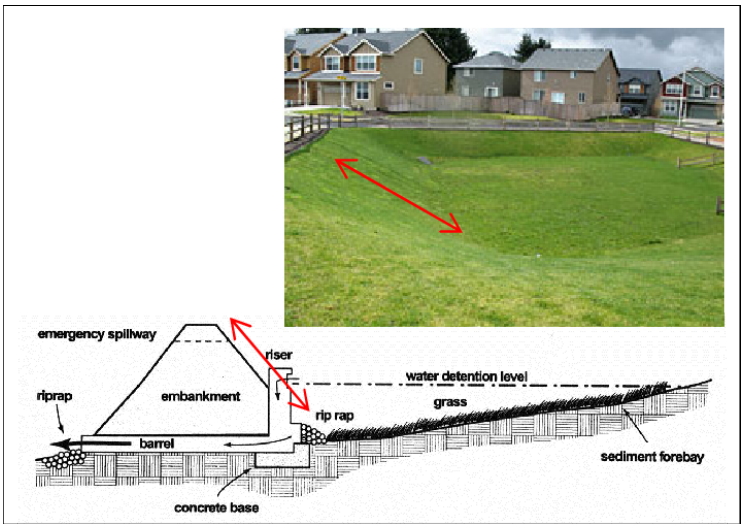


Figure 4: Schematic of the embankment and spillway of a dry pond.

The embankment and emergency spillway should be free from erosion. Unstable areas can cause major structural problems if not addressed.

INLET AND OUTLET STRUCTURES OR RISERS

Ensure that all outlets structures are unblocked. The small hole at the bottom of the plate was completely blocked causing the area around the pond to hold water before the work had been completed.

Ensure all vegetation in and around the outlet structure is removes. Cattails usually grow in areas that have water ponded for extended periods of time. Vegetation can block water flow and cause flooding if not removed.

Inlet headwalls should be clear of all vegetation. Scouring and erosion around the headwall should be fixed.

SEDIMENT FOREBAYS

Sediment forebays are a place for material to settle before the pond area. This sediment forebay is doing its job, but sediment needs to be removed periodically to prevent a large cleaning that can cost a lot more.

PERMANENT POOL AREAS

Erosion around the permanent pool area of the wet pond should be fixed as soon as possible. Erosion like this can cause additional sections of the land to fall into the pond.

Algae can become a huge problem in wet ponds. Here are a few solutions that may help:

- Circulation systems, such as fountains, can help decrease algae.
- Aquatic herbicides can be applied by a licensed Category 5 applicator.
- Properly apply fertilizer to the contributing drainage area.

Remove woody vegetation from permanent pool areas.

MAINTENANCE REQUIRED WHEN:

- Outlet, or low flow orifice, is blocked by trash, debris, or vegetation.
- Erosion in and around the emergency spillway or the embankments, or side slopes, of the pond.
- Forebay are is blocked with sediment or trash.
- Excessive vegetation within the bottom, side slopes, or dam of a pond.
- Animal burrows within the dam or side slopes of the pond.
- Trees, or woody vegetation, growing on the dam.
- Dam or embankment show signs of visible water seepage.

ROUTINE AND NON-ROUTINE MAINTENANCE

Routine Maintenance:

- Outlet Structure: Keep outlets such as the outlet structure, the low flow orifice, and the emergency spillway free from blockage by sediment, debris, or trash.
- Dam/Embankment: Mow grassed dam and embankment of the wet pond to prevent woody debris from establishing.
- Erosion and Scour: Repair soil erosion or scouring on the side slopes leading into the wet pond.
- Vegetation Management: Remove vegetation from around the outlet structure and inlet of the wet pond.
- Sediment and Debris: Remove accumulated sediment and debris from the forebay and ponding area.

Non-Routine Maintenance:

- Excessive Sediment: Remove sediment from the ponding area when the pool volume is reduced by 25% or more.
- Invasive Vegetation: Treat and remove invasive vegetation from the ponding area, forebay, side slopes, and dam. Cattails are a common invasive vegetation that grow within wet ponds.

- Outlet Structure: Repair or replace the damaged outlet structure.
- Erosion Protection: Repair or replace the stone protection at the inlets, outlets, and emergency spillway.
- Dam/Embankment: If seepage, leaks, or erosion is discovered on the dam or embankment, seek professional consultation from an engineer.

DRY POND AREAS

Ensure the dry pond area is fully stabilized and vegetation is healthy. Trees can be planted in the bottom of the dry pond but should not be placed in the side slopes or on top of the dam to help prevent failures.

Dry ponds should fully drain within 72 hours. If water is still present after 72 hours, the area may need to be regraded or sediment accumulation removed.

Erosion around the headwall should be fixed. Woody vegetation should be removed. Stone protection may need to be replaced or additional stone added to prevent further erosion in the future.

MAINTENANCE REQUIRED WHEN:

- Standing water is visible 72 hours after a rain event. (Dry Ponds only)
- Outlet is blocked by trash, debris, or vegetation.
- Erosion in and around the emergency spillway or the embankments, or side slopes, of the pond.
- Forebay are is blocked with sediment or trash.
- Excessive vegetation within the bottom, side slopes, or dam of a pond.
- Animal burrows within the dam or side slopes of the pond.
- Trees, or woody vegetation, growing on the dam.

ROUTINE AND NON-ROUTINE MAINTENANCE

Routine Maintenance:

- Outlet Structures: Keep outlets such as the outlet structure, the low flow orifice, and the emergency spillway free from blockage by sediment, debris, or trash.
- Dam/Embankment: Mow grassed dam and embankment of the dry pond to prevent woody debris from establishing.
- Erosion and Scour: Repair soil erosion or scouring on the side slopes leading into the dry pond.
- Vegetation Management: Remove vegetation from around the outlet structure and inlet of the dry pond.
- Sediment and Debris: Remove accumulated sediment, debris, and trash from the forebay and ponding area. Remove sediment when the accumulation reaches a depth of 6 inches or more.

Non-Routine Maintenance:

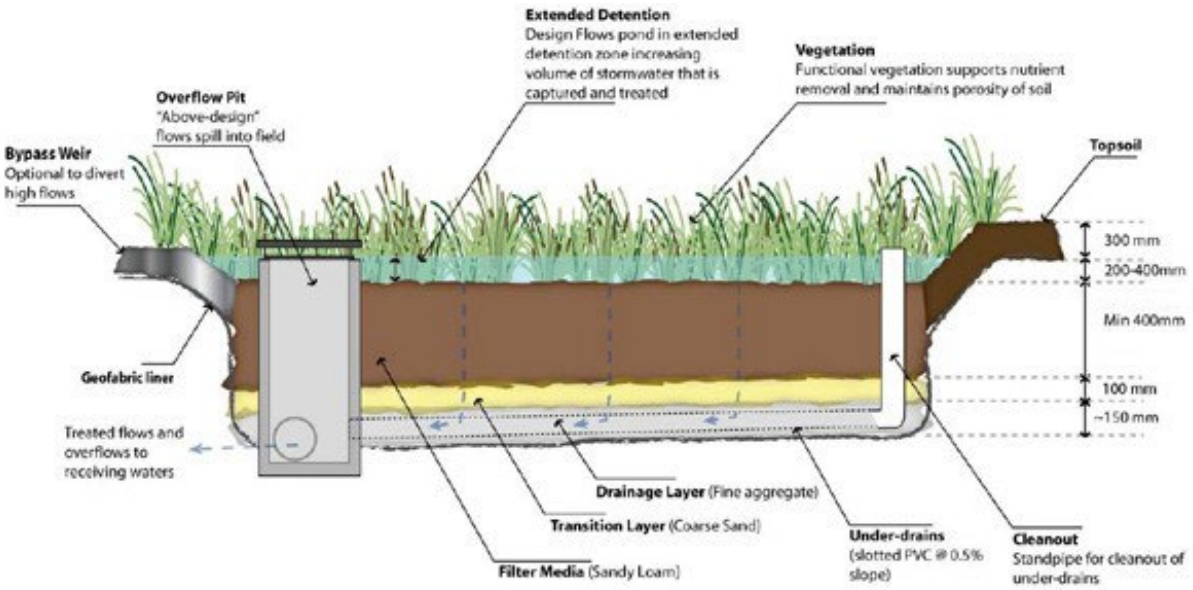
- Excessive Sediment: Remove sediment from the ponding area when the pool volume is reduced by 25% or more.

- Invasive Vegetation: Treat and remove invasive vegetation from the ponding area, forebay, side slopes, and dam. Cattails are a common invasive vegetation that grow within wet areas of dry ponds.
- Outlet Structure: Replace or repair the damaged outlet structure.
- Erosion Protection: Repair or replace the stone protection at the inlets, outlets, and emergency spillway.
- Dam/Embankment: If seepage, leaks, or erosion is discovered on the dam or embankment, seek professional consultation from an engineer.

BIORETENTION AREAS

DESCRIPTION

Bioretention areas are depressed areas that allow for shallow ponding of stormwater runoff that use a special soil to capture and treat runoff from impervious surfaces such as parking lots and rooftops. The soil media and vegetation filter pollutants and improve water quality. The soil media is a special mix of sand, topsoil, and organic material that allows for additional infiltration while supporting the native vegetation that is planted. Underdrains are typically used in Franklin bioretention areas to drain the filtered stormwater to the storm sewers. Below is a cross section that outlines the different sections of a typical bioretention area within the City.



(Construction and Establishment Guidelines V1.1 April 2010; Image 3.1, Typical cross section through a bioretention system)

Figure 5: Cross section of a bioretention area

RAIN GARDENS

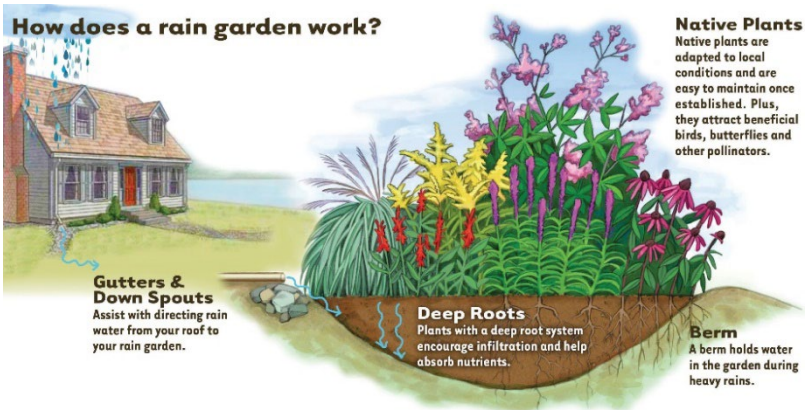


Figure 6: Typical rain garden

Rain gardens are a type of bioretention area that are typically less designed. They are mostly utilized on a single residential lot. Rain gardens are depressed like a bioretention area, but typically do not have an overflow structure or the gravel layer beneath the soil. The soil and native vegetation are the same as a larger bioretention area.

WATER QUALITY SWALE (BIOSWALE)

Water quality swales are bioretention areas that are more linear and sloped. They typically have check dams installed within the swale and will have an outlet structure and an underdrain to help aid in infiltration. The picture to the right shows a check dam within the water quality swale. They can be made of wood, as shown, concrete, or stone.

Figure 7: Wooden check dam in a water quality swale

DETAILED INSPECTION AND MAINTENANCE

PRETREATMENT AREAS

Bioretention areas can have multiple pretreatment areas. Depending on the level of the bioretention area, one or two pretreatment measures are required by the City. The two most common are pretreatment forebays, like both dry and wet ponds, and stone diaphragms. Pretreatment forebays help slow down the runoff to prevent erosion and help filter out pollutants before the bioretention areas. Stone diaphragms are typically used with sheet flow, such as runoff from parking lots. They help filter out the runoff and evenly spread the runoff to prevent erosion.

Stone diaphragms are typically used between bioretention areas and parking lots. All debris and accumulated material, such as asphalt fines, should be removed. Once clogged, erosion can occur within the bioretention area and additional material can accumulate.

Pretreatment forebays can be lined with either stone or grass. Material that has accumulated should be removed periodically.

INLET/OUTLET STRUCTURES

Erosion around inlets should be fixed. This headwall has had erosion occur underneath the headwall. Erosion can also occur around the headwall from

heavy flows.

Curb cuts can cause scouring into the bioretention area. Ensure the curb cut if free of debris and blockages. Remove accumulated sediment and replace any scour protection.

Check the inside of outlet structures to ensure the outlet pipes are not clogged. Remove any mulch or debris within the outlet structure.

BIORETENTION BASIN

Curb cuts causing erosion and sediment accumulation in the bioretention area. Scour protection added around the curb cut can help prevent erosion and scouring.

Erosion and sediment accumulation can cause water to pond for greater than 48 hours. Sediment should be removed, and mulch replaced. Additional scour protection at the inlets of the bioretention area may be needed. Pine straw mulch has a high tendency to float and degrade faster than hardwood mulch. While it is an approved mulch cover, the City does not recommend it for a bioretention mulch cover.

Sediment accumulation can cause a hard crust on the top of the bioretention surface and prevent infiltration. Remove sediment until the amended soil, which is usually a darker color, is reached.

Weeds should be removed periodically during the growing season to prevent overgrowth. Native vegetation should be pruned and maintained in the fall to prevent overgrowth.

MAINTENANCE REQUIRED WHEN:

- Standing water visible 48 hours after a rain event.
- Erosion is visible within the bioretention area, or on and around the slopes and inlets around the area.
- Vegetation or sediment is blocking the overflow structure.
- Vegetation is dying or wilted.
- Sediment has accumulated in the pretreatment areas or bioretention area.
- Mulch layer should be replaced every growing season.
- Vegetation is overgrown, and weeds are present.

ROUTINE AND NON-ROUTINE MAINTENANCE

Routine Maintenance:

- Sediment and Debris: Remove accumulated sediment and debris from the pretreatment measures and surface of the bioretention area.
- Outlet Structure: Keep outlets of the bioretention area free from blockages by mulch, plant material, trash, and sediment.
- Erosion and Scour: Repair soil erosion or scouring within the bioretention area, side slopes, or inlets.
- Mulch: Maintain a 2 to 3-inch layer of hardwood mulch layer. Add or remove mulch to maintain the 2 to 3-inch layer. If stone is used, clean stone from fines when necessary.
- Curb Cuts: Keep curb cuts to the bioretention area free from blockages by sediment, trash, or debris.
- Weeds: Remove weeds and invasive plants from the bioretention area routinely.

- Vegetation Management: Inspect plant health seasonally to ensure growth. Prune plants during the dormant season (fall to early spring).

Non-Routine Maintenance:

- Plant Replacement: Replace diseased or dying plants.
- Water Ponding: When ponding occurs for greater than 48 hours, there may be a construction or design issue that need to be corrected. An engineer may need to be contacted for further design assistance.
- Soil Replacement: Clogging of the soil, or a soil failure, may require replacement of the amended soils.

UNDERGROUND TREATMENT DEVICES

DESCRIPTION

PROPRIETARY TREATMENT DEVICES (WATER QUALITY UNIT)

Water quality units are underground systems that help filter out pollutants before the stormwater runoff flows offsite. Water enters the unit through storm drains. Sediment (soil), trash, and oil are filtered out, settle to the bottom of the unit, or are separated from the water. Every system is unique to the manufacturer. These units can be designed in multiple different ways. Ensure the manufacturers maintenance plan is being followed.

Figure 8: Water quality unit

UNDERGROUND DETENTION

Figure 9: Installation of a concrete vault underground detention system.

Underground detention is large underground chambers or pipes that capture and store stormwater runoff below the surface. These are used in space limited areas, such as parking lots, where land for a large surface facility for storing stormwater is unavailable. Pretreatment structures are typically installed with any underground detention facility.

DETAILED INSPECTION AND MAINTENANCE

WATER QUALITY UNITS

MAINTENANCE REQUIRED WHEN:

- Standing water is noticeable in the sediment or filter chamber
- The facility has reached its capacity for sediment accumulation. Reference the manufacturer's inspection and maintenance manual for specific threshold amounts.
- Manufacturer's regular maintenance interval has passed
- Obstructions, like trash and debris, are visible at the inlet or outlet.

** Do not enter these facilities to inspect unless Occupational Safety & Health Administration (OSHA) regulations for confined space entry are followed.

**Follow the inspection and maintenance instructions and schedules provided by the system manufacturer and the installer.

UNDERGROUND DETENTION

MAINTENANCE REQUIRED WHEN:

- Sediment and debris is accumulated at the inlets or outlet of the system.
- There is visible damage to the inlets or outlet.
- Inspection of pipes or chambers through the inspection port (if installed) shows that sediment is greater than design criteria.

** Do not enter underground detention manholes to inspect unless Occupational Safety & Health Administration (OSHA) regulations for confined space entry are followed.

**Follow the inspection and maintenance instructions and schedules provided by the system manufacturer and the installer.

PERMEABLE PAVEMENT

DESCRIPTION

Permeable pavement allows infiltration of runoff through open areas on the pavement surface. There are two types that are more widely utilized than the rest.

Permeable pavers have open joints between concrete interlocking pavers that allow stormwater runoff to infiltrate to a base stone layer. These joints have small gravel placed in the joints to help with the structural stability of the pavement.

Pervious concrete has open pores throughout the pavement that allow for the stormwater runoff to filter through.

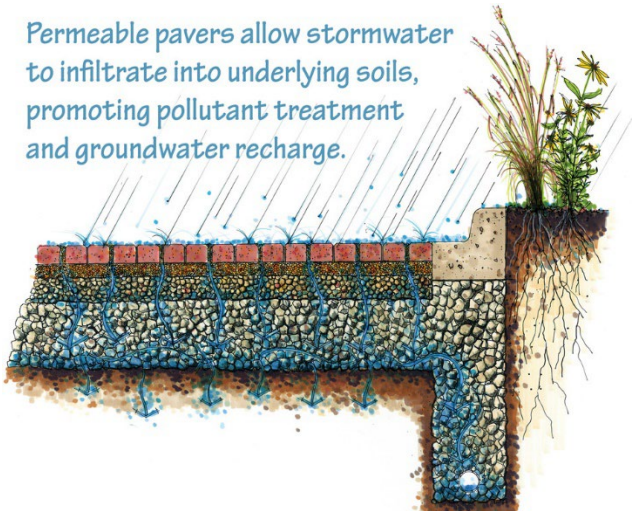


Figure 10: Typical permable paver cross section

Regular inspection and maintenance are key to these SCMs. The sediment accumulates on the surface after every rain event. A regular vacuum and sweeping schedule should be in place to prevent clogging of the pores.

DETAILED INSPECTION AND MAINTENANCE

CONTRIBUTING DRAINAGE AREA

The drainage area of the permeable pavers and pervious concrete should be stabilized and consist of mainly impervious area. Landscape islands and other grassed areas can cause sediment or other landscape debris to clog the surface. Overhanging trees can also cause leaf litter to clog these surfaces.

PERVIOUS CONCRETE

Run on from asphalt can cause clogging within pervious concrete. Ensure these areas are swept periodically to prevent clogging of the pavement surface.

The lowest point of the pavers can collect a lot of the fines and sediment that run on to the concrete. These areas should be maintained routinely and areas contributing to the sediment accumulation stabilized.

PERMEABLE PAVERS

Oils from the vehicles parking on the paver area can clog the paver joints. Clean the paver joints by air vacuum, jet vacuum, or pressure washing.

Sediment from unstable areas can cause the paver joints to clog. Sometimes air vacuuming cannot fully remove all sediment. Jet vacuums, that utilized forced water and vacuum, can help break up the sediment and make it easier to remove.

Vegetation should be removed from the joints of the pavers.

Asphalt fines can cause heavy accumulation within the paver joints. Sweep regularly to prevent heavy accumulation and ponding.

MAINTENANCE REQUIRED WHEN:

- Standing water is visible on the surface after a rain event.
- Significant amounts of sediment or debris have accumulated on the surface of the pavement or in the concrete paver joints.
- Vegetation is growing in concrete paver joints.
- Deterioration of the pervious concrete pavement surface that generate gravel and fine sediment.
- Gravel between concrete pavers is missing.

ROUTINE AND NON-ROUTINE MAINTENANCE

Routine Maintenance:

- Ponding: Inspect pavement during pavements to detect ponding and clogging. Vacuum sweeping can remove fines.
- Sediment and Debris: Remove accumulated sediment and debris from the pavements surface area by vacuum sweeping or pressure washing. Gravel will need to be replaced if removed.
- Weeds: Remove weeds or grass on the surface of the pavement.
- Vacuum Sweep: Vacuum sweep the entire surface or known clogged areas using an air street sweeper. More than one pass may be necessary. A vacuum with water jets may be needed.

Non-Routine Maintenance:

- Gravel Replacement: Replace the gravel within the joints of the permeable pavers, especially after vacuum sweeping.
- Pavement Cleaning: Remove stains using a biodegradable detergent.
- Pavement Repair: Replace deteriorated permeable pavers or pervious concrete.

RIPARIAN BUFFERS

Figure 11: Riparian buffer with a buffer sign installed.

DESCRIPTION

Riparian, or stream and wetland, buffers are required to protect both water quality and wildlife habitat in these sensitive areas. The vegetation, soils, and drainage patterns area also protected. In the City, most of these areas are denoted by signs, as seen below.

Riparian buffers are not touch, no disturb areas. No mowing or clearing should take place within a buffer zone.

DETAILED INSPECTION AND MAINTENANCE

MAINTENANCE REQUIRED WHEN:

- Encroachment into the riparian area is noted in the yearly inspection.
- Vegetation is removed, or disturbance is observed.
- Significant populations of non-native and invasive plants are observed.

GRASS CHANNELS

DESCRIPTION

Grass channels, or swales, are designed to take stormwater runoff through an open channel. The grass helps filter pollutants through the channel.

DETAILED INSPECTION AND MAINTENANCE

The main issues that arises in grass channels is erosion. Erosion can occur at the inlet, typically a headwall, or throughout the channel. Any erosion should be fixed and the area restabilized. Some scour protection may be needed if erosion continues to occur.

MAINTENANCE REQUIRED WHEN:

- Erosion or bare soil is visible in the bottom of the swale or on the side slopes.
- Trash, debris, or sediment have accumulated within the swale or in front of the inlet.

APPENDICIES

APPENDIX 1: GLOSSARY OF COMMONLY USED TERMS

Amended Soils: A special blend of soil that has a higher sand content than the natural soils in the Franklin area. These soils allow for increased infiltration.

Berm: An elongated elevated earthen ridge that is used to hold or direct stormwater runoff.

Bioretention: A process in which contaminants and sediment are removed from stormwater runoff. Stormwater is collected into the treatment area which consists of a ponding area comprised of

specialized soils that allow runoff to filter through the mulch layer and underlying soils. The surface is planted with perennials, shrubs or trees.

Bioretention Area: Location where stormwater runoff is filtered through specialized soil mixes that remove pollutants and allow runoff to infiltrate downward into underlying soils.

Check Dams: a small dam constructed across a swale to slow down stormwater and help filter large pollutants, such as trash.

Curb Cut: An opening in the concrete or asphalt curbing of streets or parking lots that is flush with the surface of the pavement and the SCM to allow stormwater runoff to flow into the SCM.

Dam: The earthen structure or embankment that impounds runoff in a pond, lake or reservoir.

Dry Pond or Dry Extended Detention Basin: A stormwater design feature that provides temporary stormwater runoff storage; gradually releasing a controlled volume of stormwater over a 24- to 48-hour interval to increase settling of urban pollutants and protect channels from degradation. Dry ponds dewater fully.

Debris: Dead plant or other organic material consisting mainly of fallen leaves.

Emergency Spillway: The structure that safely conveys overflows from a pond, lake or reservoir facility during large precipitation events.

Forebay: A distinct area near an inlet of a pond to enhance deposition of incoming sediments.

Impervious Cover: Any hard surface that prevents water from infiltrating into the soil.

Infiltration: The gradual downward movement of water from the surface through the soil to groundwater.

Invasive Vegetation: Vegetation that is not native to the Franklin area. Invasive vegetation kills of native vegetation, which provides safe habitat and food sources for wildlife.

Inlet: A structure that controls and conveys an SCM's inflow of stormwater runoff.

Micropool: A small pool area typically located near the outlet of a dry or wet pond.

Monitoring Well (Cleanout): Inspection point for SCMs that contain underground components or storage chambers. Also known as an observation port.

Post-Construction Stormwater Management Practices: Those practices designed for the treatment of stormwater pollutants and effects of stormwater runoff after construction is completed.

Permeable Pavement: An alternative to conventional pavement whereby stormwater runoff is diverted through a porous surface and into layers of underground stone that act as a storage reservoir. The stored stormwater runoff then gradually infiltrates into the subsoil or an underdrain system.

Outlet: A structure that controls and conveys an SCM's outflow of stormwater runoff.

Rain Garden: A shallow depression containing amended soils intended to allow collected from to soak into existing soils landscaped with perennial plant materials that assist with pollutant removal and evapotranspiration of collected rainwater and stormwater runoff.

Riparian Buffer: The vegetated transition zone between flowing water and terrestrial ecosystem, which provides a continuous exchange of nutrients and woody debris between land and water. It generally includes not only the stream channel, but also flood plains and associated wetlands.

Riprap: Rock placed over a layer of geotextile fabric, sand or gravel used to armor stormwater pipe outlets or emergency spillways against flowing water reducing erosion and scouring of soils.

Stabilization: Vegetative or structural soil cover controlling erosion that includes permanent and temporary seed, mulch, sod or stone.

Side Slopes: Slopes of dams, embankments, spillways, and the facility perimeter.

Stormwater Control Measure (SCM): Practices used to lessen the impacts of stormwater runoff. These techniques may involve structures, vegetation, or amended soils. Also known as best management practices (BMPs).

Stormwater Management: A system of structural and non-structural practices used to control water quantity and improve water quality of stormwater runoff.

Stormwater Runoff: Stormwater that runs off impervious area or that is not infiltrated in pervious areas, such as grass or landscaping.

Stormwater Treatment: The removal of pollutants from urban runoff and improvement of water quality, accomplished largely by deposition and utilizing the benefits of natural processes.

Swale: An elongated depression in the land used to convey stormwater runoff.

Trash Rack: Device placed upstream of the principle outlet or drain to intercept debris.

Underdrain System: The drainage system used in bioretention and vegetated infiltration swales to convey stormwater runoff that did not fully infiltrate into underlying soils of the SCM.

Underground Detention: An underground stormwater detention system comprised of chambers, vaults or pipes that store captured stormwater runoff and allow runoff to infiltrate through a layer of gravel into underlying existing soils.

Water Quality Volume: The extended detention volume captured for the purposes of treating pollutants and protecting stream stability downstream.

Wet Pond or Wet Extended Detention Basin: A stormwater design feature that provides temporary stormwater runoff storage; gradually releasing a controlled volume of stormwater over a 24 to 48-hour

interval to increase settling of urban pollutants and protect channels from degradation. A conventional wet pond or wet extended detention basin has a permanent pool of water.

Woody Vegetation: A plant that produces wood as its structural tissue. Woody plants are usually either trees or shrubs.

APPENDIX 2: INSPECTION AND MAINTENANCE CHECK LISTS

City of Franklin Inspection and Maintenance Check Lists:

- Bioretention Area/Rain Garden
- Constructed Wetlands
- Downspout Disconnection
- Dry Pond
- Green Roof
- Grass Channel
- Infiltration Trench
- Storm Sewers
- Water Quality Swale
- Water Quality Unit
- Water Resource (Riparian) Buffer
- Wet Pond

City of Franklin, TN
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Bioretention Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name: _____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Pre-Treatment Area				
Area free of debris?	*A/M*			
Standing water longer than 24 hours after a storm event?	*A/S*			
Bare soil or erosion?	*M/S*			
Excessive landscape waste/yard clippings?	*A/M*			
Inlet/Outlet Structures				
Inlets provide stable conveyance into the facility?	*A*			
Evidence of erosion at or around inlet?	*A*			
If connected to extended detention, is outlet to pond functioning properly?	*A*			
Other	*A*			
Basin				
Adjacent area fully stabilized (no evidence of eroding material into Bioretention area)?	*A*			
Plant height not less than design ponding depth?	*A*			
Adequate media layer present?	*A*			
Plant composition according to approved plan?	*A*			
Is there any sign of mowing or disturbance?	*A/M*			
Vegetation overgrown?	*A*			
Invasive species/weeds present?	*A*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Dead vegetation or exposed soil present?	*A*			
Maintenance access to facility?	*A*			
Excessive trash/debris/sediment?	*A*			
Evidence of erosion?	*A*			
Evidence of standing water (Ponding, Noticeable Odors, Water Stains, Algae)?	*A/M*			
If underdrain system, is it broken or clogged?	*A/M*			
Overflow structure free of blockage and operating properly?	*A*			
Other	*A*			
Hazards				
Have there been complaints from residents?	*A/M*			
Public hazards noted?	*A/M*			
Mosquito proliferation?	*A/M*			
Is there encroachment on pervious area or easement by buildings or other structures?	*A/S*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	**Due Date**

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature)_____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
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To be submitted as part of annual report to City

REV 2/2015

Constructed Wetlands Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address_____Phone Number_____

Site Status: _____

Date:_____Time:_____Site conditions: _____

Constructed Wetland Type: ED Wetland ☐ Pocket Wetland ☐ Wetland ☐

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	**Inspection Frequency**	**Inspected? (Yes/No)**	**Maintenance Needed? (Yes/No)**	**Comments/Description**
Embankment and Emergency Spillway				
Vegetation healthy?	*A/S*			
Erosion on embankment?	*A/S*			
Animal burrows in embankment?	*A/S*			
Cracking, sliding, bulging of dam?	*A/S*			
Drains blocked or not functioning?	*A/S*			
Leaks or seeps on embankment?	*A/S*			
Slope protection failure functional?	*A/S*			
Emergency spillway obstructed?	*A/S*			
Erosion in/around emergency spillway?	*A/S*			
Other (describe)	*A/S*			
Riser and Principal Spillway				(describe type: concrete pipe, slotted weir, channel, etc.)
Low-flow orifice functional?	*A/S*			
Trash rack (Debris removal needed? Corrosion noted?)	*A/S*			
Sediment buildup in riser?	*A*			
Concrete/masonry condition (Cracks or displacement? Spalling?)	*A*			
Metal pipe in good condition?	*A*			
Control valve operation?	*A*			
Pond drain valve operation?	*A*			
Outfall channels function, not eroding?	*A*			
Other (describe)	*A*			

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Inspection Items	**Inspection Frequency**	**Inspected? (Yes/No)**	**Maintenance Needed? (Yes/No)**	**Comments/Description**
Sediment Forebays				
Sedimentation description				
Sediment cleanout needed (over 50 percent full)?	*A/S*			
Constructed Wetland Ponding Areas				
Wetland vegetation present and healthy?	*M*			
Vegetation removal needed?	*A/M*			
Floatable debris removal needed?	*M*			
Visible pollution?	*M*			
Shoreline problem?	*M*			
Erosion at outfalls into pond?	*M*			
Headwalls and endwalls in good condition?	*M*			
Encroachment into pond or easement area?	*M*			
Hazards				
Have there been complaints from residents?	*M*			
Public hazards noted?	*M*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	**Due Date**

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

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Engineering Department
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To be submitted as part of annual report to City

REV 2/2015

Downspout Disconnection Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Disconnection Type: Soil Amendment ☐ Infiltration Trench ☐ Bioretention ☐
Rainwater Harvesting ☐ Stormwater Planter ☐ Simple Disconnection ☐

Note: Disconnection Type should also be evaluated per the appropriate Checklist located in this Appendix.
Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Pipes, Gutters, and Drains				
Downspouts provide stable conveyance into facility?	*A/S*			
Runoff enters pervious area as sheet flow?	*A/S*			
Excessive trash/debris/sediment/oil/chemicals accumulation at inflow points?	*A/S*			
Evidence of erosion at/around inflow points?	*A/S*			
Disconnection Treatment				(describe type: concrete pipe, slotted weir, channel, etc.)
Downspouts or surface impervious area drains to the receiving pervious area?	*A/S*			
Receiving treatment area retains dimensions as shown on plans and is in good condition?	*A/S*			
Sediment accumulation?	*A*			
Is erosion at simple disconnection, bioretention, filter paths, or planter present?	*A*			
Evidence of standing water (Ponding, Noticeable Odors, Water Stains, Algae)?	*A*			
Is vegetation in place?	*A*			
Is plant composition consistent with	*A*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
approved plans?				
Are invasive species/weeds present?	*A*			
Is dead vegetation or exposed soil present?	*A*			
Other (describe)	*A*			
Contributing Drainage Area-Rooftop				
Treatment area retains dimensions as shown on plans and is in good condition?				
Is there encroachment on pervious area or easement by buildings or other structures?	*A/S*			
Hazards				
Have there been complaints from residents?	*M*			
Public hazards noted?	*M*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Grass Channel Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Debris Removal				
Facility and adjacent area free of debris?	*M*			
Inlets and outlets free of debris?	*M*			
Any dumping of yard wastes into facility?	*M*			
Litter (branches) removed?	*M*			
Vegetation				
Surrounding area fully stabilized? (no evidence of eroding material into swale, channel or filter strip)	*M*			
Grass mowed?	*M*			
Grass height not less than 3 to 4 inches?	*M*			
Fertilized per specifications?	*M*			
Grasses planted according to approved plan?	*M*			
Unauthorized or inappropriate plantings?	*A*			
Grasses healthy? (no diseased or dying vegetation)	*M*			
Evidence of grasses stressed from inadequate watering?	*M*			
Filtration Capacity				
Clogging from oil or grease?	*M*			
Facility dewaters between storms?	*M*			
Check dams and energy dissipaters/sumps				
Any evidence of sedimentation buildup?	*A,S*			
Are sumps greater than 50% full of sediment?	*A,S*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Any evidence of erosion and downstream toe of drop structures?	*A,S*			
Any trash or blockages at weep holes?	*A,S*			
Sediment Deposition				
Swale clean of sediments?	*A*			
Sediment not > 25% of swale design depth?	*A*			
Outlet/Overflow Spillway				
In good condition?	*A*			
Any evidence of erosion?	*A*			
Any evidence of blockages?	*A*			
Has facility been filled or blocked inappropriately?	*A*			
Hazards				
Have there been complaints from residents?	*M*			
Public hazards noted?	*M*			
Maintenance accesses free of hazards and fully operational?	*M*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
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To be submitted as part of annual report to City

REV 2/2015

Green Roof Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

***Green roof inspections should occur twice per year during the growing season. Please submit both checklists once annually.

Green Roof Type: Extensive Roof Cover ☐ Intensive Roof Garden ☐

Inspection Frequency Key: A=annual; M=monthly; S=after major storms; G=monthly during April-September growing season only

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Drainage				
Gutter inlets blocked by plant debris/trash or plant growth hindered by debris?	*M*			
Roof drains and scuppers overgrown or full of organic matter?	*2x per Yr*			
Standing water present?	*M*			
Vegetation				
Evidence of additional irrigation needs?	*G*			
Fallen leaves/debris interfering with plant health?	*M*			
Dead plants to be replaced?	*M*			
Need for weeding/mowing/trimming?	*G*			
Soil Substrate/Growing Medium				
Evidence of wind or water erosion?	*A*			
Structural Components				
Evidence of structural deterioration?	*A*			
Load-bearing walls in good condition?	*A*			
Spalling or cracking of structural parts?	*A*			
Access/maintenance routes maintained and free of debris?	*M*			
Mechanical units free of leaks or spills?	*M*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Hazards				
Have there been complaints from residents?	*M*			
Public hazards noted?	*M*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
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To be submitted as part of annual report to City

REV 2/2015

Infiltration Trench Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address_____ Phone Number_____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Debris Removal				
Trench surface clear of debris?	*M*			
Contributing area free of debris?	*M*			
Inlets/Inflow pipes free of debris?	*M*			
Overflow spillway clear of debris?	*M*			
Vegetation				
Mowing done when necessary?	*M*			
Unauthorized or inappropriate plantings?	*A*			
Fertilized per specification?	*M*			
Evidence of erosion?	*M*			
Contributing drainage area stabilized?	*M*			
Trees growing in the trench?	*A*			
Dewatering				
Trench dewaters between storms?	*M*			
Sediment traps, forebays, or pretreatment swales				
Adequately trapping sediment?	*A*			
Structural damage?	*A*			
Greater than 50% of original storage volume remaining?	*A*			
Sediment removal of trench				
Any evidence of sedimentation in trench?	*A*			
Are pea gravel/topsoil and top surface filter fabric functioning properly?	*M*			
Does sediment accumulation currently require removal?	*A*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Inlets				
Good condition (no need for repair)?	*A*			
Evidence of erosion?	*A*			
Outlets/overflow spillway				
Good condition (no need for repair)?	*A*			
Evidence of erosion?	*A*			
Aggregate repairs				
Surface of aggregate clean?	*A*			
Top layer of stone in need of replacement?	*A*			
Trench in need of rehabilitation?	*A*			
Observation wells				
Evidence of clogging/failure to percolate? (Should percolate within 3 days.)	*M*			
Has drawdown rate been measured at observation well and is well capped?	*A*			
Hazards				
Have there been complaints from residents?	*M*			
Public hazards noted?	*M*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Permeable Pavement Inspection and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address:_____ Phone Number:_____

Site Status: _____

Date:_____ Time:_____ Site conditions:_____

*****Conduct maintenance inspection in the spring of each year.

Pavement Type: ☐ Pervious Concrete/Asphalt ☐ Modular Pavers ☐ Grass/Gravel Pavers

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Pavement Area				
Pavement area free of debris?	*A/M*			
Staining or sediment?	*A/M*			
Inlets and outlets unobstructed and sediment free?	*A/M*			
All contributing drainage area free of erosion and sources of sediment?	*A/M*			
Water standing after a storm event?	*S*			
Any evidence of clogged pores that require vacuum-sweeping?	*A/M*			
Has area been vacuum swept in the past 12 months?	*A/M*			
Access to pervious pavement (egress and ingress routes) safe and efficient?	*A/M*			
Has drawdown rate been measured at observation well and is well capped?*	*A*			
Structural integrity of the pavement intact? Look for deterioration such as: slumping, cracking, spalling, or broken pavers.	*A/M*			
Grass Pavers				
Paver area stabilized/fully vegetated?	*A/M*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Adjacent area fully stabilized (no evidence of eroding material onto/from pervious pavement area)?	*A/M*			
Any noticeable irrigation needs?	*A/M*			
Fallen leaves/plant debris collecting in paving area?	*A/M*			
Grass height over 4 inches?	*A/M*			
Vegetation health affected by oil/grease from vehicles?	*A*			
Other	*A*			
Hazards				
Obstructions or debris affecting overflows/emergency spillways?	*A/M*			
Load-bearing capability of pavement intact?	*A/M*			

*Refer to GIP-03 Section 11.3 for further guidance.

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Stormwater Pond Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name: _____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Stormwater Pond Type: Wet Pond ☐ Wet Extended Detention Pond ☐ Micropool Pond ☐
Multiple Pond System ☐ Dry Pond ☐

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Embankment and Emergency Spillway				
Vegetation healthy?	*A/S*			
Erosion on embankment?	*A/S*			
Animal burrows in embankment?	*A/S*			
Cracking, sliding, bulging of dam?	*A/S*			
Drains blocked or not functioning?	*A/S*			
Leaks or seeps on embankment?	*A/S*			
Slope protection failure functional?	*A/S*			
Emergency spillway obstructed?	*A/S*			
Erosion in/around emergency spillway?	*A/S*			
Other (describe)	*A/S*			
Outlet Structure, Riser, and Spillway				(describe type: concrete pipe, slotted weir, channel, etc.)
Low-flow orifice functional?	*A/S*			
Trash rack (Debris removal needed? Corrosion noted?)	*A/S*			
Sediment buildup in riser?	*A*			
Concrete/masonry condition (Cracks or displacement? Spalling?)	*A*			
Metal pipe in good condition?	*A*			
Control valve operation?	*A*			
Pond drain valve operation?	*A*			
Outfall channels function, and are free of erosion, undercutting, rip-rap displacement, wood growth, etc?	*A*			
Other (describe)	*A*			
Sediment Forebays				
Sedimentation description				
Sediment cleanout needed (over 50 % full)	*A/S*			

City of Franklin
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To be submitted as part of annual report to City

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Contributing Drainage Area				
Banks upstream and downstream free of sloughing , animal burrows, boggy areas, woody growth and gully erosion?	*A/M*			
Excessive trash, debris, erosion or landscaping waste?	*A/M*			
Permanent Pool Areas (if applicable)				
Undesirable vegetation growth?	*A/M*			
Visible pollution?	*A/M*			
Shoreline erosion?	*A/M*			
Erosion at outfalls into pond?	*A/M*			
Headwalls and endwalls in good condition?	*A/M*			
Encroachment into pond or easement area by other activities?	*A/M*			
Evidence of sediment accumulation?	*A*			
Dry Pond Areas (if applicable)				
Vegetation adequate?	*A/M*			
Undesirable vegetation or woody plant growth?	*A/M*			
Excessive sedimentation?	*A*			
Hazards				
Have there been complaints from residents?	*A/M*			
Public hazards noted?	*A/M*			
Maintenance accesses free of hazards and fully operational?	*A/M*			

Inspector Comments: _____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2023

Riparian Buffer Inspection and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name: _____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	
Disturbance				
Are there any signs of clearing, grading, construction, storage, mowing or other disturbance of vegetation or soil taken place in the buffer??	*A/M*			
Are there any signs of erosion within the buffer or banks of the stream?	*A/M*			
Are there any surrounding disturbances that might be threats to the buffer or water quality?	*A/M*			
Buffer State				
Would the general state of the buffer be described as an undisturbed native successional forest or similar?	*A/M*			
Are there any diseased, dying, or endangering trees in the buffer?	*A/M*			
Is the buffer contain more than 30% exotic invasive material?	*A/M*			
Signs				
Are buffer signs still clearly visible and in good legible condition? If not clear back vegetation or replace.	*A/M*			

City of Franklin, TN
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To be submitted as part of annual report to City

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Note: There shall be no clearing, grading, construction, storage or disturbance of vegetation or soil allowed in the Water Resource Buffer except as permitted by the City Engineer. There is to be no mowing of grass or cutting of trees in the buffers except for vegetation that is diseased, dying or in danger of adjacent structures. Report any of this in the comments section below.

Inspector Comments: _____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, Tn
Stormwater Division
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Storm Sewer Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Indicate Features Present: Catch Basins ☐ Storm Pipe ☐ Headwalls ☐ Outfalls ☐ Catch Basin Inlets ☐

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Catch Basins				
Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition ensure all are set properly in place over inlets	*A/S*			
Check for sediment, leaf, or debris clogging grates and remove	*A/S*			
Catch Basin Inlets				
Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition	*A/S*			
Inspect for blockage or sediment accumulation and remove when capacity is diminished by 20% or greater	*A/S*			
Pipes				
Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition	*A/S*			
Inspect for blockage or sediment accumulation and remove when capacity is diminished by 20% or greater.	*A/S*			
Concrete/masonry condition of pipes and joints? (Cracks or displacement? Spalling?)	*A/S*			

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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Headwalls and Endwalls				
Ensure all are structurally sound and in good condition. Note any deficiencies and repair to proper working condition	*A/S*			
Inspect for blockage or sediment	*A/S*			
Check for erosion or scouring around headwall inlets and repair	*A/S*			
Evidence of staining?	*A/S*			
If flowing water is present does it appear to contain anything other than stormwater? I.e. Discoloration, odors, sheens, etc? Note location and describe.	*A/S*			
Hazards				
Have there been complaints from residents?	*A/S*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
615-791-3218

To be submitted as part of annual report to City

REV 2/2015

Water Quality Swale Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name: _____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	
Pre-Treatment Area				
Area free of debris?	*A/M*			
Standing water longer than 24 hours after a storm event?	*A/S*			
Bare soil or erosion?	*M/S*			
Excessive landscape waste/yard clippings?	*A/M*			
Inlet/Outlet Structures				
Inlets provide stable conveyance into the facility?	*A*			
Evidence of erosion at or around inlet?	*A*			
If connected to extended detention, is outlet to pond functioning properly?	*A*			
Other	*A*			
Basin				
Adjacent area fully stabilized (no evidence of eroding material into Bioretention area)?	*A*			
Adequate media layer present?	*A*			
Plant composition according to approved plan?	*A*			
Invasive species/weeds present?	*A*			

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Engineering Department
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Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	
Dead vegetation or exposed soil present?	*A*			
Maintenance access to facility?	*A*			
Excessive trash/debris/sediment?	*A*			
Evidence of erosion?	*A*			
Evidence of standing water (Ponding, Noticeable Odors, Water Stains, Algae)?	*A/M*			
If underdrain system, is it broken or clogged?	*A/M*			
Overflow structure free of blockage and operating properly?	*A*			
Other	*A*			
Hazards				
Have there been complaints from residents?	*A/M*			
Public hazards noted?	*A/M*			
Mosquito proliferation?	*A/M*			
Is there encroachment on pervious area or easement by buildings or other structures?	*A/S*			

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____

Inspected by: (printed) _____

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Engineering Department
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Proprietary BMP Inspections and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name:_____

Address_____ Phone Number_____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Debris Removal				
Adjacent area free of debris?	*M*			
Inlets and Outlets free of debris?	*M*			
Facility (internally) free of debris?	*M*			
Vegetation				
Surrounding area fully stabilized? (no evidence of eroding material into proprietary BMP)				
Grass mowed?	*M*			
Water retention where required				
Water holding chambers at normal pool?	*M*			
Evidence of erosion?				
Sediment Deposition				
Filtration Chamber free of sediments?	*A*			
Sedimentation chamber not more than 50% full?	*A*			
Structural Components				
Any evidence of structural deterioration?	*A*			
Grates in good condition?	*A*			
Spalling or cracking of structural parts?	*A*			
Outlet/Overflow Spillway	*A*			
Other				
Noticeable odors?	*A*			
Any evidence of filter(s) clogging?	*M*			
Evidence of flow bypassing facility?	*A*			

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Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature) _____
Inspected by: (printed) _____

City of Franklin, TN
Engineering Department
615-791-3218

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REV 2/2015

Water Resource Buffers Inspection and Maintenance Checklist

Site Name:_____ Owner Change since last inspection?

Location: _____

Owner Name: _____

Address:_____ Phone Number: _____

Site Status: _____

Date:_____ Time:_____ Site conditions: _____

Inspection Frequency Key: A=annual (required); M=monthly (recommended); S=after major storms (recommended)

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	
Disturbance				
Are there any signs of clearing, grading, construction, storage, mowing or other disturbance of vegetation or soil taken place in the buffer??	*A/M*			
Are there any signs of erosion within the buffer or banks of the stream?	*A/M*			
Are there any surrounding disturbances that might be threats to the buffer or water quality?	*A/M*			
Buffer State				
Would the general state of the buffer be described as an undisturbed native successional forest or similar?	*A/M*			
Are there any diseased, dying, or endangering trees in the buffer?	*A/M*			
Is the buffer contain more than 30% exotic invasive material?	*A/M*			
Signs				
Are buffer signs still clearly visible and in good legible condition? If not clear back vegetation or replace.	*A/M*			

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Note: There shall be no clearing, grading, construction, storage or disturbance of vegetation or soil allowed in the Water Resource Buffer except as permitted by the City Engineer. There is to be no mowing of grass or cutting of trees in the buffers except for vegetation that is diseased, dying or in danger of adjacent structures. Report any of this in the comments section below.

Inspector Comments:_____

_____

_____

_____

Overall Condition of Facility: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is scheduled for approximately: _____
(date)

Inspected by: (signature)_____
Inspected by: (printed) _____

SCM Maintenance Companies Serving Franklin

The following is a list of companies that inspect and facilitate maintenance for post construction water quality Stormwater Control Measures (SCMs).

This list is for your convenience only and is not a recommendation or endorsement by the City of Franklin of the services these companies provide nor is it an exclusive list of companies that offer SCM maintenance in the City of Franklin.

Company	Contact	Phone	SCM Focus
Acer Landscape Services	Jason Stewarts	615-207-1763	All
All Source Maintenance Solutions	Marvin Francis	615-347-7287	All
Apex Companies	Stephen Polzella	484-318-9598	All
A & L Drainage Company	Alex Kisac	615-332-5111	All
Aqualis	Wade Stafford	765-280-7440	All and Inspections
Beard Property Maintenance	Dwight Beard	615-331-6289	Bioretention/Ponds
BMP/SCM Doctor	Clarke Willey	270-991-4062	All
Civil Constructors Inc.	Jim Field	615-236-9000	Ponds
ECO-Group	Nick Waters	615-228-5103	Ponds
Environmental Concepts and Services	Ron Waterbury	615-879-9159	All
Evergreen Site Solutions, LLC	Van Oldham	615-633-1353	All and Inspections
Don Green Consulting	Don Green	615-308-1014	Inspections Only
First Response	Chris Duke	615-426-7305	All
Grease Master	Craig Wood	615-394-3284	No Ponds
Greenrise Technologies	Tim Hyde	615-840-3079	All and Inspections
Hepaco	Loren Gerhardt	615-882-0033	All
Hickory Hardscapes	Joe Pierce	865-206-0691	Permeable Pavement
Jen-Hill Construction Materials	Ben Moody	615-824-1200	All
Northstar Environmental Group	Colby Phillips	615-451-4867	All
Onsite Environmental	Doug Rashi	615-238-3901	All
Ops Contracting Services, LLC	Robert Wilkinson	615-289-4513	All
Sani-Tech	Brien Welsh	615-843-6828	No Ponds
SCA Jet Vac	Connor Welsh	615-843-6828	All
Stormwater Solutions, USA	Breck Bowlin	865-321-2847	All
Storm System Services	Jeffrey Askew	678-990-0178	All
Straightline Construction	Tony Travierso	615-330-0178	All
SWPP Management, LLC	Clyde Baumgartner	615-587-4805	All
Tennessee Concrete Association	Alan Sparkman	615-975-6696	Pervious Concrete
Tennessee Erosion Control, Inc	Ryan Piatt	615-788-5957	All and Inspections
Tennessee Stormwater Co.	Willie Dorman	615-856-5800	All
TPM, Inc.	Terry Breshears	615-585-0995	All
Tri-State Erosion Control	Rick Lord	615-330-2391	All
Tradebe Environmental Services, LLC		800-914-9111	All
Water Quality & Erosion Control of TN	Jean Matthews	615-292-4812	Inspections Only

PLEASE NOTE:

General safety precautions should be followed for all SCM maintenance activities. OSHA permit-required confined space protocols must be followed during the inspection and maintenance of certain stormwater quality underground detention units.

In addition to this list:

As another resource, the University of Tennessee (UT) and the Tennessee Department of Environment and Conservation (TDEC) provides a state wide training and certification program for post construction SCM inspection and maintenance. For the list of certified professionals, visit: https://tnpermanentstormwater.org/SCMIMcertLIst.asp

To add your company, please email the City of Franklin Stormwater Management Department at stormwater@franklintn.gov.