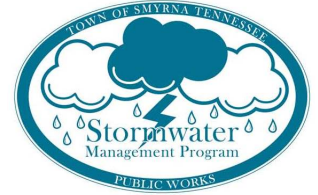




Town of Smyrna Stormwater Control Measure Long Term Maintenance Plan



Section I – Owner Responsibilities

The owners of SCMs shall be the person, persons, trust, corporation, etc. or their successors who have title to the privately owned land on which the stormwater system is located. The stormwater system will be operated, inspected and maintained on a regular basis by the owner or a qualified erosion prevention and sediment control (EPSC) professional with expertise in inspecting drainage system components acting on behalf of the owner. The stormwater system shall be kept in good working order at all times. As a minimum, the owner shall follow the general guidelines outlined herein for the privately owned stormwater system. An operation and maintenance log must be maintained which outlines inspections, repairs, replacement and disposal. The log must be made available to the Town of Smyrna upon request. Conveyance measures such as ditches, swales, berms, pipes, etc. that are located in the Right of Way or on private property in a drainage easement are excluded from the Long Term Maintenance Plan (LTMP).

Owners of above-ground stormwater control measures (SCMs) are encouraged to inspect stormwater systems annually using the provided inspection forms in this document. Completed inspection forms should be submitted to the Town of Smyrna Stormwater Division. Underground SCMs **must** be inspected annually by the Owner or a representative of the Owner with results reported to the Town. If an inspection result is not received by the Town for an above-ground SCM, the Town will inspect the system annually on behalf of the owner.

A comprehensive inspection of all stormwater management facilities and practices shall be performed every 5 years on the behalf of the owner by a qualified erosion prevention and sediment control (EPSC) professional with expertise in inspecting drainage system components. Such inspections must be conducted by either a professional engineer, professional surveyor, landscape architect, or other qualified EPSC. Results of this inspection must be submitted to the Town of Smyrna and any recommended maintenance actions undertaken within 45 days of the inspection occurring. Complete inspection reports for these five-year inspections shall include:

- a. Facility type,
- b. Inspection date,
- c. Latitude and longitude and nearest street address,
- d. BMP owner information (e.g. name, address, phone number, fax, and email),
- e. A description of BMP condition including: vegetation and soils; inlet and outlet channels and structures; embankments, slopes, and safety benches; spillways, weirs, and other control structures; and any sediment and debris accumulation,
- f. Photographic documentation of BMPs, and
- g. Specific maintenance items or violations that need to be corrected by the BMP owner along with deadlines and re-inspection dates not to exceed 30 days from the initial inspection.

Additional information on SCM design guidelines, descriptions, capabilities, inspection and maintenance requirements, example schematics, and other considerations can be found in the City of Murfreesboro Stormwater Control manual which has been recognized and adopted by the Town of Smyrna. All SCM owners are advised to review this material for a more detailed account of their stormwater system.

Section II – SCM General Maintenance Requirements

GENERAL

General maintenance on-site should consist of maintaining all privately owned stormwater system components (i.e. detention basins) in acceptable conditions. In general, these maintenance practices can be performed by a simple walk-through and take action if necessary.

STRUCTURES

Storm Structure SCMs consist of structure structures such as headwalls, stormwater inlets, outlet structures, and check dams that are planned to be utilized in the permanent stormwater system. General maintenance will consist of checking for and removing sedimentation or blockages, confirming outlet control structures are functioning, concrete failures, and standing water. The maintenance schedule for these items should be performed on a semi-annual basis. Equipment needed for maintenance will range from shovel to general concrete repair equipment.

STORM PIPES

Storm culverts are utilized to convey stormwater runoff from one location to another in a closed (i.e. piped) system. General maintenance for stormwater culverts/pipes outside of the ROW or drainage easement will consist of debris removal, checking for erosion upstream and downstream, checking for sedimentation at upstream end and within pipes at cleanouts, flushing of pipes to remove sediment, removal of blockages, pipe settlement, joint failure, pipe failures, standing water, and check for consistent flow lines. The maintenance schedule for these items should be performed on a semi-annual basis. Equipment needed for maintenance will range from shovel, water hose, auger, grout work, seed and mulch, backhoe, and replacement pipes.

DETENTION POND

The detention pond is a surface storage basin or facility designed to provide water quantity through detention, extended detention. General maintenance will consist of debris removal, checking for erosion at entry points and on the slopes, checking for sedimentation and loss of capacity in grassy areas of the ponds, checking for signs of slope failures, checking the condition of the primary spillways, standing water, and checking for consistent flow in the low flow areas. The maintenance schedule for these items should be performed on a semi-annual basis. Equipment needed for maintenance will range from shovel, water hose, grout work, seed and mulch, and backhoe.

Maintenance requirements for dry detention ponds include the following:

- 1) Maintain grass height of 3 to 4 inches.
- 2) Remove vegetation that could affect pond capacity or outcompete stabilizing ground cover.
- 3) Remove sediment build up in pond bottom.
- 4) Ensure that rills and gullies have not formed on side slopes. Repair if necessary.
- 5) Remove trash and debris build up.
- 6) Replant areas where vegetation has not been successfully established.

UNDERGROUND DETENTION

Underground detention consists of underground pipe/tank systems or vaults designed to provide water quantity treatment through detention or extended detention. These systems serve as an alternative to surface dry detention for stormwater quantity control, particularly for space-limited areas where there is not adequate land for a dry detention basin or multi-purpose detention area. General maintenance will consist of debris removal, trash removal, and performing structural repairs to inlets, outlets, and storage areas. The maintenance schedule for these items should be performed on an annual basis. Equipment needed for maintenance will range from shovel, concrete repair equipment, grout work, and backhoe.

All underground SCMs are to be inspected using the appropriate form below by an EPSC professional annually with inspection results submitted to the Town of Smyrna Stormwater Division

BIORETENTION

Bioretention areas (also referred to as bioretention filters or rain gardens) are structural stormwater controls that capture and temporarily store the water quality treatment volume (WQv) using soils and vegetation in shallow basins or landscaped areas to remove pollutants from stormwater runoff. Bioretention areas are engineered facilities in which runoff is conveyed as sheet flow to the “treatment area” which consists of a grass buffer strip, ponding area, organic or mulch layer, planting soil, and vegetation. The filtered runoff is typically collected and returned to the conveyance system, though it can also infiltrate into the surrounding soil in areas with porous soils.

General maintenance will consist of debris and trash removal, vegetation management, weed removal, repair of structural defects, removal of hydrocarbon or pollutant build-up, removal of excess sediment from forebay, repair of eroded areas, and revegetating of unplanned denuded areas. If a system contains an underdrain pipe, additional maintenance will include replacement of broken structures, removal of built-up sediment from clogged pipes, and inspection for erosion at system inflow. The maintenance schedule for these items should be performed on a semi-annual basis. Equipment needed for maintenance will range from shovel, gardening tools, water hose, grout work, seed and mulch, and backhoe.

PERMEABLE PAVEMENT

Permeable pavement includes three primary types of pavement and paver systems: modular pavers, pervious concrete, and porous asphalt. Each pavement type is placed on a gravel (stone aggregate) base course. Runoff infiltrates through the porous paver surface into the gravel base course, which acts as a storage reservoir as it infiltrates to the underlying soil. General maintenance consists of removal of trash, debris and excess sediment from surface, inspecting perimeter of paver area for erosion, repairing and revegetating when necessary, repairing deteriorated or damaged areas, and identifying and removing areas where pollutants have spilled into the system. The maintenance schedule for these items should be performed on an annual basis. Equipment needed for maintenance will range from shovel, water hose, grout work, replacement material, seed and mulch, backhoe, and vacuum truck.

All underground SCMs are to be inspected annually using the appropriate inspection form below by an EPSC professional with inspection results submitted to the Town of Smyrna Stormwater Division. In addition, all Permeable Paver systems must perform ASTM International C 1781/C 1781M standard infiltration rate testing to determine current infiltration rate and compare with previous annual infiltration testing results. When the infiltration rate has been reduced by 10-20% from the initial infiltration rate, the site must be rehabilitated such as by a remedial sweeper.

PROPRIETARY MANUFACTURED TREATMENT DEVICE (MTD)

There are commercially-available proprietary stormwater controls designed for water quality treatment and/or for detention. The main types are hydrodynamic systems, filtration systems, prefabricated structures for underground detention, and pre-designed treatment system such as planter boxes for trees or packaged wetland systems. The most common use of manufactured systems designed for removing pollutants is on small, commercial-use sites where there the cost of land and the intense use of the property leaves little space for stormwater treatment. Unless required for an unusual facility or source of pollutant, filtration systems are not allowed by the Town. General maintenance consists of removal of trash or debris from system, removal of built-up sediment in system, inspection for and repair of erosion at inlets and outlets, inspection for and repair of structural failure, depressions on surface or other indicators of settling, deterioration of adjacent paved surfaces, and inspection and removal of any pollutants in structure or on paved areas. The maintenance schedule for these items should be performed on an annual basis. Equipment needed for maintenance will range from shovel, concrete repair equipment, grout work, and backhoe.

All underground SCMs are to be inspected annually using the appropriate inspection form below by an EPSC professional with inspection results submitted to the Town of Smyrna Stormwater Division.

Section III – Annual Inspection and Maintenance Forms

Inspector Name	Facility Name
Inspector Affiliation	Facility Location
Inspector Phone	




Public Works Department
Stormwater Division
315 S Lowry Street
Smyrna, TN 37167
(615) 355-5701

Operation & Maintenance Inspection Underground Detention

Inspection Item	Observed						Comments
	+	-	x	A/M/S	Y/N		
Inlets & Outlets							
Inlets /outlets obstructed with trash, debris, vegetation							
Evidence of excess sediment entering inlets							
Evidence of excess sediment leaving treatment unit							
Erosion at inlets/outlets							
Damage to inlet/outlet structures							
Inlet filter (if applicable) obstructed and/or in poor condition							
Treatment Unit							
Maintenance access obstructed							
Depressions in pavement surface, other indicators of settling							
Disconnected/leaking pipes, other evidence of joint failure							
Sediment in vault requiring removal							
Trash/floating debris in vault requiring removal							
Permanent pool depth too high/low							
Adjacent Areas							
Construction activity in CDA**							
Eroded/destabilized surfaces in CDA							
Deterioration of adjacent paved surfaces							
Other							
Unauthorized modifications to drainage system/treatment unit							
Additional Notes:							
Inspector Signature	Date			Time			

*Inspection Frequency: A/M/S = Annually, Monthly, following a major Storm, **CDA = Contributing Drainage Area

Inspector Name	Facility Name	 Stormwater Division 315 S Lowry Street Smyrna, TN 37167 (615) 355-5701
Inspector Affiliation	Facility Location	
Inspector Phone		

**SCM Operation & Maintenance Inspection
Checklist
Bioretention**

Type On-line Offline
No. Cells

Inspection Item	Frequency*					Y/N	Comments
	Observed +	Did not observe -	Did not inspect x	Frequency*	Action Required		
Bioretention Surface							
Evidence of clogging/standing water							
Scouring/erosion of vegetated surfaces							
Trash/debris/other contaminants							
Sediment deposits							
Depressions in bioretention basin							
Surface fails to drain completely between rain events							
Drainage & Pre-treatment System Components							
Drainage system fails to completely dewater between rain events							
Altered drainage pattern, flow diversion, short circuiting, etc.							
Broken cleanouts, missing/stuck caps, other structural damage							
Cleanout, underdrain clogged with sediment/debris							
Erosion at system inflow (headwalls, curb cuts, downspouts, etc.)							
Structural damage to pre-treatment forebay or gravel diaphragm							
Excessive sediment (> 3") in forebay/gravel diaphragm							
Vegetation							
Shallow/bare spots in mulch layer (< 3")							
Less than 80% vegetative cover (plants and much combined)							
Weeds, invasive and/or undesirable plants present							
Plants are unhealthy or overgrown							
Other							
Construction activity in CDA**							
Eroded/destabilized surfaces in CDA							
Other sources of sediment in CDA							

Additional Notes:

Inspector Signature	Date	Time
---------------------	------	------

*Inspection Frequency: A/M/Q/S/ST = Annually, Monthly, Quarterly, Semi-annually, following a major Storm
 **CDA = Contributing Drainage Area

Inspector Name	Facility Name
Inspector Affiliation	Facility Location
Inspector Phone	



Public Works Department
 Stormwater Division
 315 S Lowry Street
 Smyrna, TN 37167
 (615) 355-5701

**Operation & Maintenance Inspection Checklist
 Permeable Pavement**

PAVEMENT TYPE: Permeable Pavers
 Porous Concrete
 Porous Asphalt
 Other (specify) _____

Inspection Item	Frequency*					Comments
	Observed	Did not observe	Did not inspect	Frequency*	Maintenance Required	
	+	-	x	A/M/S	Y/N	
Pavement Surface						
Evidence of clogging/standing water						
Sediment deposits						
Trash/debris						
Cracks/indicators of deterioration						
Depressions, potholes						
Surface fails to dewater between rain events						
Evidence of staining, oil, other contaminants						
Drainage Structures						
Broken cleanouts/other structural damage						
System fails to completely dewater between rain events						
Cleanout, underdrain clogged with sediment/debris						
Adjacent Areas						
Construction activity in CDA**						
Eroded/destabilized surfaces in CDA						
Deterioration of adjacent paved surfaces						
Other						
Unauthorized modifications (replacement with traditional pavement, expanded parking area)						
Additional Notes:						

Inspector Signature	Date	Time
---------------------	------	------

*Inspection Frequency: A/M/S = Annually, Monthly, following a major Storm, **CDA = Contributing Drainage Area

