

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS
ADMINISTRATIVE RULE
CHAPTER 109
DIVISION 011
OPERATIONS AND MAINTENANCE OF STORMWATER FACILITIES

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1.1 – Introduction

Stormwater facilities control the flow rate, flow volume, or flow duration of drainage water, or remove pollutants from drainage water. *Salem Revised Code* Chapter 71 contains criteria for when these facilities are required. The City of Salem *Public Works Design Standards* provides methods, criteria, and requirements for designing and constructing stormwater facilities. *Salem Revised Code* Chapters 70 and 71 require stormwater facilities to be properly operated and maintained. Stormwater facilities shall be operated and maintained in accordance with this rule.

- (a) **Purpose.** This rule describes requirements for operating and maintaining stormwater facilities. These requirements, which include inspections, routine maintenance activities, corrective actions, and recordkeeping, are designed to help ensure stormwater facilities operate as designed to provide stormwater pollutant removal and/or flow control.
- (b) **Applicability.** The provisions of this rule apply pursuant to *Salem Revised Code* Chapter 70 (Utilities, General), Chapter 71 (Stormwater), and the City of Salem *Public Works Design Standards*.
- (c) **Authority to Adopt.** This rule is authorized by *Salem Revised Code* Chapters 20J, 70, and 71. The requirements contained in this rule shall be consistent with the *Salem Revised Code*. In those cases where a conflict may exist, the *Salem Revised Code* will take precedence.

1.2 – Definitions

Terms in this rule defined in the *Salem Revised Code* and the City of Salem *Public Works Design Standards* have the same meaning, except as otherwise provided in this rule or as context requires. Other terms in this rule are defined herein. Terms specifically defined in this rule apply only to the application and enforcement of these rules. Unless otherwise expressly provided in the *Salem Revised Code*, and except as the context specifically requires, the following terms shall mean:

- (a) **Aboveground Storage Tank.** A stationary container, vessel, or other permanent holding device designated for the storage and/or distribution of a liquid product.
- (b) **Bulk Fuel Terminal (also known as Tank Farms).** Any area with its primary function dedicated to the storage and distribution of fuel to distributors (such as gas stations).
- (c) **Bulk Storage Tank.** Aboveground fuel tanks larger than 55 gallons or 660 gallons in cumulative fuel storage in one location.
- (d) **Equipment and/or Vehicle Washing Facilities.** Designated equipment and/or vehicle washing or steam cleaning areas, including smaller activities such as wheel washing stations.
- (e) **Fuel Dispensing Facilities.** Areas where fuel is transferred from bulk storage tanks to vehicles, equipment, and/or mobile containers (including fuel islands, aboveground fuel tanks, fuel pumps, and the surrounding pad). This definition applies to large-sized gas stations and single pump fueling operations.
- (f) **Manufactured Treatment Technology.** A manufactured device, often proprietary, in which stormwater receives treatment before being discharged to another best

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management practice or to the receiving water. This is a broad category of best management practices with a variety of pollutant removal mechanisms and varying pollutant removal efficiencies.

- (g) **Material Transfer Areas/Loading Docks.** Areas that are designed to accommodate a truck or trailer, typically by backing, and used specifically to receive or distribute materials, including loading/unloading facilities with docks and large bay doors without docks.
- (h) **Pretreatment.** The reduction of contaminants in drainage water before it is discharged into a treatment facility or receiving water body. Pretreatment facilities are primarily used to reduce sediments, floating solids, or oil and grease.

1.3 – Other Regulatory Requirements

Conforming to requirements of this rule does not relieve persons of other local, state, or federal regulatory requirements. In the event of a conflict between regulatory requirements, the most stringent requirement will apply.

1.4 – Responsibility for Operations and Maintenance

Operation and maintenance of public stormwater facilities is the responsibility of the City of Salem. Operation and maintenance of private stormwater facilities is the responsibility of persons owning, operating, or occupying the property. Under certain conditions, the City of Salem will assume responsibility for operating and maintaining a stormwater facility; however, until the transfer of these responsibilities to the City is completed and acknowledged by all parties, operation and maintenance remains the responsibility of the person owning, operating, or occupying the property.

Public improvement projects and private development that propose to construct facilities that will ultimately be operated and maintained by the City shall be designed, constructed, operated, and maintained in compliance with *Salem Revised Code Chapter 71*, the *Public Works Design Standards*, and this rule. The City will assume responsibility for operating and maintaining stormwater facilities only after the design and construction requirements have been fully met as determined by the City through submitted documentation and on-site inspection. The City may require remedies to unsatisfactory design, construction, or maintenance activities as a condition of the City's assuming responsibility for the facility. After final approval and acceptance of a facility, the City shall assume maintenance activities.

1.5 – Maintenance of Private Stormwater Facilities

- (a) **Operating and Maintaining Private Stormwater Facilities.** Persons responsible for operating and maintaining a private stormwater facility are required to:
 - (1) Periodically inspect the stormwater facility to ensure the facility is in proper operation for effective pollutant removal, infiltration, and/or flow control;
 - (2) Maintain a record of the construction of, and all inspection, maintenance, and repair activities to, the stormwater facility; and
 - (3) Make plans, records, procedures, and schedules of maintenance available to the Director during inspection of the stormwater facility, and at other reasonable times upon request of the Director; and

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- (4) If a change of ownership occurs, transfer all records of installation, inspection, repair, and maintenance of the stormwater facility to the new property owner; and
- (5) Inform future purchasers and other successors and assignees of:
 - (i) The existence of the stormwater facility; and
 - (ii) The requirements for continued inspection and maintenance of the stormwater facility.

(b) Private Stormwater Facility Agreement. A Private Stormwater Facility Agreement is required for any development that includes the construction of a stormwater facility that will be privately operated and maintained. The agreement will be submitted as part of the development permit application process. At a minimum, the agreement will:

- (1) Provide the property address and contact information for the property owner;
- (2) Document the number, types, and locations of facilities;
- (3) Establish the responsibility of the owner to inspect, operate, and maintain facilities in accordance with approved standards;
- (4) Identify the maintenance and operating standards and activities that will be implemented to ensure long-term functioning of the stormwater facilities;
- (5) Grant the City access for the purpose of inspecting facilities and, in the event any deficiencies are not corrected in a timely manner by the owner, for the purpose of correcting deficiencies; and
- (6) Grant the City access if the City has reasonably determined that emergency measures are necessary to remedy a threat to public health, safety, or welfare caused by facilities.

The Private Stormwater Facility Agreement is provided in Appendix A. A copy of the signed and notarized agreement will be maintained on file by the Public Works Director.

1.6 – Minimum Requirements for Operations and Maintenance

Facility Maintenance Forms provided in this rule contain minimum requirements for inspection, maintenance, and repair activities for stormwater facilities. These forms provide a means to document required activities. For any stormwater facility not addressed by this rule, a maintenance form or similar documentation shall be provided to the Public Works Director describing operating standards, maintenance activities, condition criteria, and schedules that will be implemented to ensure long-term functioning of the facility.

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Appendix A to 109-011 – Private Stormwater Facilities Agreement

This Agreement is made and entered into this _____ day of _____, 20____, by and between the City of Salem (City) and _____ (Owner) whose address is _____.

RECITALS

A. Owner has developed or will develop property with the stormwater facilities listed below. (List the type of private stormwater facilities on site and the quantity of each type).

Facility type (list each)	Quantity
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B. The Facilities enable development of property while mitigating the adverse impacts of stormwater runoff and pollutants associated with stormwater runoff prior to discharge from the property directly or indirectly to the public stormwater system, another private stormwater system, or to receiving waters.

C. The property benefited by the stormwater facilities and subject to the obligation of this Agreement is described below or in Exhibit A (Property) attached hereto and incorporated by reference, with the location of each stormwater facility as indicated.

D. The stormwater facilities are designed by a registered professional engineer in accordance with the requirements of Salem Revised Code Chapter 71 (Stormwater) and the *Public Works Design Standards*.

E. Failure to properly inspect and maintain the stormwater facilities can result in unacceptable impacts to the public stormwater system, receiving waters, the environment, and downstream properties.

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Appendix A to 109-011 – Private Stormwater Facilities Agreement

NOW, THEREFORE, it is agreed by and between the parties as follows:

1. MAINTENANCE

Owner agrees to maintain each stormwater facility in accordance with requirements provided by, or approved by, the City so that it is in proper working condition for effective pollutant removal, infiltration, and/or flow control.

2. INSPECTION

Owner agrees to inspect each stormwater facility in accordance with requirements provided by, or approved by, the City.

3. RECORDKEEPING

Owner agrees to maintain a record of the construction of, and all inspections, maintenance, and repair activities to, each stormwater facility and to make plans, records, procedures, and schedules of maintenance available to the Public Works Director during inspection of each stormwater facility, and at other reasonable times upon request of the Public Works Director.

4. REPAIR

Owner agrees to make any repairs as necessary to keep each stormwater facility in continuous working order. All deficiencies shall be corrected at Owner's expense within 30 days after the deficiency has been identified a deficiency, unless more than 30 days is reasonably needed to correct a deficiency. Owner shall have a reasonable period to correct the deficiency so long as the correction is commenced within the 30-day period and is diligently prosecuted to completion.

5. CITY CORRECTIONS

If correction of all Owner- or City-identified deficiencies is not completed within 30 days after Owner's inspection or City notice, City shall have the right to have any deficiencies corrected. In such instances, City:

- (i) Shall have access to the stormwater facilities for the purpose of correcting such deficiencies; and
- (ii) Shall bill Owner for all costs reasonably incurred by City for work performed to correct the deficiencies following Owner's failure to correct any deficiencies in the Facilities.

Owner shall pay the City within 30 days of the date of the invoice. Owner understands and agrees that upon non-payment, City may place a lien on the property for the amount plus interest and penalties.

6. ACCESS

Owner grants City the right to inspect the stormwater facilities. City will endeavor to give at least 10 days prior notice to Owner, except that no notice shall be required in case of an emergency. City shall determine whether deficiencies need to be corrected. Owner will be notified in writing of the deficiencies.

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Appendix A to 109-011 – Private Stormwater Facilities Agreement

7. CHANGE OF OWNERSHIP

If a change of ownership occurs, owner agrees to transfer all records of installation, repair, and maintenance of each stormwater facility to the new property owner. Owner will inform future purchasers and other successors and assignees of the existence of the stormwater facility and of the requirements for continued inspection and maintenance of the stormwater facility.

8. EMERGENCY MEASURES

If, at any time, City reasonably determines that a stormwater facility is creating an imminent threat to public health, safety, or welfare, City may immediately and without prior notice to Owner take measures reasonably designed to remedy the threat. City shall provide notice of the threat and the measures taken to Owner as soon as reasonably practicable. City may charge Owner for the cost of these corrective measures.

9. HOLD HARMLESS

Owner shall indemnify and hold City harmless from any and all claims for damages to persons or property arising from the construction, operation, inspection, maintenance, or use of each stormwater facility.

10. FORCE AND EFFECT

This Agreement has the same force and effect as any deed covenant running with the land and shall benefit and bind all owners of the property present and future, and their heirs, successors and assigns.

11. AMENDMENTS

The terms of this Agreement may be amended only by mutual agreement of the parties. Any amendments shall be in writing, shall refer specifically to this Agreement, and shall be valid only when executed by the owners of the property and the City and recorded in the Official Records of the county where the Property is located.

12. PREVAILING PARTY

In any action brought by either party to enforce the terms of this Agreement, the prevailing party shall be entitled to recover all costs, including reasonable attorney's fees as may be determined by the court having jurisdiction, including any appeal.

13. SEVERABILITY

The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.

After recording, return to:
City of Salem Public Works Department
555 Liberty Street SE, Room 325
Salem OR 97301-3513

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Appendix A to 109-011 – Private Stormwater Facilities Agreement

IN WITNESS WHEREOF, the parties hereto have signed this Agreement as of the date below.

By: _____
Owner

Title

STATE OF OREGON)
) ss.
County of _____)

This instrument was acknowledged before me on _____, 20____, by
_____.

Notary Public—State of Oregon
My commission expires: _____

Approved:

By: _____
Public Works Director

City of Salem, Oregon

By: _____
City Manager

STATE OF OREGON)
) ss.
County of _____)

This instrument was acknowledged before me on _____, 20____, by
_____, as City Manager of the City of Salem, Oregon.

Notary Public—State of Oregon
My commission expires: _____

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Appendix B to 109-011 – Facility Maintenance Forms

This appendix contains Facility Maintenance Forms that provide minimum requirements for inspection, maintenance, and repair activities for the following types of stormwater facilities:

1. Stormwater Planters
2. Rain Gardens
3. Vegetated Filter Strips
4. Swales (Vegetated, Grassy, and Street)
5. Detention Basins
6. Subsurface Gravel Treatment Wetland
7. Constructed Treatment Wetlands
8. Manufactured Treatment Technology
9. Green Roofs
10. Sand Filters
11. Pervious Pavement
12. Underground Detention Tanks, Vaults, and Pipes
13. Conveyance: Piped
14. Conveyance: Open Channel
15. Soakage Trenches
16. Drywells

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1. Stormwater Planter

Stormwater Planters are designed to allow runoff to filter through layers of topsoil (thus capturing pollutants) and then either infiltrate into the native soils (infiltration planter) or be collected in a pipe to be discharged off-site (filtration planter). The planter is sized to accept runoff and temporarily store the water in a reservoir on top of the soil. The filtration planter is designed with an impervious bottom or is placed on an impervious surface. Water should drain through the planter within 24 hours after a storm event.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Downspout from rooftop or sheet flow from paving allows unimpeded stormwater flow to the planter.

- Debris shall be removed routinely and upon discovery.
- Damaged pipe shall be repaired upon discovery.

Inspection Comments: _____

Splash blocks prevent splashing against adjacent structures and convey water without disrupting media.

- Any deficiencies in structure such as cracking, rotting, and failure shall be repaired.

Inspection Comments: _____

Planter reservoir receives and detains stormwater prior to infiltration. Water should drain from planter within 24 hours of storm event.

- Sources of clogging shall be identified and corrected.
- Topsoil may need to be amended with sand or compost, or replaced.

Inspection Comments: _____

Amended soils consisting of sand, compost, drain rock, and topsoil shall allow stormwater to percolate uniformly through the planter.

- The planter shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates.
- Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- Litter and debris shall be removed.

Inspection Comments: _____

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Appendix B to 109-011 – Facility Maintenance Forms

1. Stormwater Planter (continued)

Planter shall contain filter media and vegetation.

- Structural deficiencies in the planter including rot, cracks, and failure shall be repaired.

Inspection Comments: _____

Overflow pipe safely conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow pipe shall be kept clear at all times.
- Damaged pipe shall be repaired or replaced upon discovery.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater infiltration and to prevent clogging of overflow drains and interference with plant growth.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected and reported to the City as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for O&M of stormwater planters shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the stormwater planter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the stormwater planter shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

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Appendix B to 109-011 – Facility Maintenance Forms

1. Stormwater Planter (continued)

Nuisance insects and rodents shall not be harbored in the stormwater planter.

Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the stormwater planter shall be filled and compacted.

Inspection Comments: _____

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Appendix B to 109-011 – Facility Maintenance Forms

2. Rain Garden

A rain garden is a **vegetated infiltration basin** or depression created by excavation, berms, or small dams to provide for short-term ponding of surface water until it percolates into the soil. The basin should infiltrate stormwater within 24 hours.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____

Inspector's Name: _____

Basin inlet shall ensure unrestricted stormwater flow to the vegetated basin.

- Sources of erosion shall be identified and controlled when native soil is exposed or erosion channels are present.
- Inlet shall be kept clear at all times.
- Rock splash pads shall be replenished to prevent erosion.

Inspection Comments: _____

Embankment, dikes, berms, and side slopes retain water in the infiltration basin.

- Structural deficiencies shall be corrected upon discovery.
- Slopes shall be stabilized using appropriate erosion control measures when soil is exposed/flow channels are forming.
- Sources of erosion damage shall be identified and controlled.

Inspection Comments: _____

Overflow or emergency spillway conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow shall be kept clear at all times.
- Sources of erosion damage shall be identified and controlled when soil is exposed.
- Rocks or other armament shall be replaced when only one layer of rock exists.

Inspection Comments: _____

Amended soils shall allow stormwater to percolate uniformly through the infiltration basin. If water remains 36 hours after a storm, sources of possible clogging shall be identified and corrected.

- Basin shall be raked and, if necessary, soil shall be excavated and cleaned or replaced.

Inspection Comments: _____

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2. Rain Garden (continued)

Sediment/Basin debris management shall prevent loss of infiltration basin volume caused by sedimentation.

- Sediment exceeding 3 inches in depth, or so thick as to damage or kill vegetation, shall be removed.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater infiltration and to prevent clogging of overflow drains and interference with plant growth.

- Restricted sources of sediment and debris, such as discarded lawn clippings, shall be identified and prevented.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that interfere with rain garden operation shall be pruned.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining vegetated infiltration basins shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the infiltration basin shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the infiltration basin shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

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2. Rain Garden (continued)

Nuisance insects and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

If used at this site, the following will be applicable:

Fences shall be maintained to preserve their functionality and appearance.

- Collapsed fences shall be restored to an upright position.
- Jagged edges and damaged fences shall be repaired or replaced.

Inspection Comments: _____

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3. Vegetated Filter Strip

Vegetated filter strips are gently sloped vegetated areas that stormwater runoff is directed to flow and filter through. Stormwater enters the filter as sheet flow from an impervious surface or is converted to sheet flow using a flow spreader. Flow control is achieved using the relatively large surface area and check dams.

Pollutants are removed through infiltration and sedimentation. The vegetative filter should drain within 48 hours of storm event.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ___/___/_____ Inspector's Name: _____

Flow spreader shall allow runoff to enter the vegetative filter as predominantly sheet flow.

- Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming.
- Sediment build-up near or exceeding 2 inches in depth shall be removed.

Inspection Comments: _____

Filter inlet shall ensure unrestricted stormwater flow to the vegetative filter.

- Sources of erosion shall be identified and controlled when native soil is exposed or erosion channels are present.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- Inlet shall be cleared when conveyance capacity is plugged.
- Rock splash pads shall be replenished to prevent erosion.

Inspection Comments: _____

Amended soils shall allow stormwater to percolate uniformly through the vegetative filter.

- If the vegetative filter does not drain within 48 hours, sources of clogging shall be identified and remedied.
- Debris in quantities more than 2" deep or sufficient to inhibit operation shall be removed routinely (e.g., no less than quarterly) or upon discovery.

Inspection Comments: _____

Check dams shall direct and control flow.

- Causes for altered water flow and channelization shall be identified, and obstructions cleared upon discovery.
- Cracks, rot, and structural damage shall be repaired.

Inspection Comments: _____

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Appendix B to 109-011 – Facility Maintenance Forms

3. Vegetated Filter Strip (continued)

Filter outlet shall allow water to exit the vegetative filter as sheet flow, unless a collection drainpipe is used.

- Sources of erosion damage shall be identified and controlled when soil is exposed or erosion channels are forming.
- Outlet shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that interfere with planter operation shall be pruned.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater conveyance and to prevent clogging of inlet drains and interference with plant growth.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining vegetated filters shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the vegetative filter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards.

- Obstacles preventing maintenance personnel and/or equipment access to the facility shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

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4. Swale - Vegetated, Grassy, and Street

Swales are vegetated, open channels that trap pollutants by filtering and slowing flows, allowing particles to settle out. The swale should drain within 48 hours of a storm event.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Swale inlet (such as curb cuts or pipes) shall maintain a calm flow of water entering the swale.

- Source of erosion shall be identified and controlled when soil is exposed or erosion channels are forming.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4" thick or so thick as to damage or kill vegetation.
- Inlet shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Rock splash pads shall be replenished to prevent erosion.

Inspection Comments: _____

Side slopes shall be maintained to prevent erosion that introduces sediment into the swale.

- Slopes shall be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are forming.

Inspection Comments: _____

Amended soils, shall allow stormwater to percolate uniformly through the landscape swale. If the swale does not drain within 48 hours following a storm event, sources of clogging shall be identified and remedied.

- Annual or semi-annual tilling shall be implemented if compaction or clogging continues.
- Debris in quantities that inhibit operation shall be removed routinely (e.g., no less than quarterly) or upon discovery.

Inspection Comments: _____

Swale outlet shall maintain sheet flow of water exiting swale unless a collection drain is used. Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming.

- Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming
- Outlets such as drains and overland flow paths shall be kept clear at all times.
- Sources of sediment and debris shall be identified and corrected.

Inspection Comments: _____

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4. Swale - Vegetated, Grassy, and Street (continued)

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that interfere with planter operation shall be pruned.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater conveyance and to prevent clogging of inlet drains and interference with plant growth.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining swales shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the swale shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the swale shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

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4. Swale - Vegetated, Grassy, and Street (continued)

If used at this site, the following will be applicable:

Check dams shall control and distribute flow.

- Causes for altered water flow shall be identified, and obstructions cleared upon discovery.
- Causes for channelization shall be identified and repaired.

Inspection Comments: _____

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5. Detention Basin

Detention basins are constructed ponds with temporary storage for the detention of large storm events. The stormwater is stored and released slowly over a matter of hours.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Inlet shall ensure unrestricted stormwater flow to the detention basin.

- Inlet pipe shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Determine if pipe is in good condition:
- If more than 4 inches of settlement, add fill material and compact soils.
- If alignment is faulty, correct alignment.
- If cracks or openings exist indicated by evidence of erosion at leaks, repair or replace pipe as needed.

Inspection Comments: _____

Forebay traps coarse sediments, reduces incoming velocity, and distributes runoff evenly over the detention basin. A minimum 1-foot freeboard shall be maintained.

- Sediment exceeding 3 inches in depth, or so thick as to damage or kill vegetation, shall be removed.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures.

Inspection Comments: _____

Embankment, dikes, berms, and side slopes retain water in the detention basin.

- Slopes shall be stabilized using appropriate erosion control measures when soil is exposed or erosion channels are forming.
- Structural deficiencies shall be corrected upon discovery:
- If cracks exist, repair or replace structure.
- If erosion channels are forming, stabilize surface. Sources of erosion damage shall be identified and controlled.

Inspection Comments: _____

Control devices (e.g., weirs, baffles, etc.) shall direct and reduce flow velocity. Structural deficiencies shall be corrected upon discovery:

- If cracks exist, repair or replace structure.

Inspection Comments: _____

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5. Detention Basin (continued)

Overflow structure conveys flow exceeding detention basin capacity to an approved stormwater receiving system.

- Overflow structure shall be kept clear at all times.
- Sources of erosion damage shall be identified and controlled when soil is exposed at the top of overflow structure or erosion channels are forming.
- Rocks or other armoring shall be replaced when only one layer of rock exists.

Inspection Comments: _____

Sediment and debris management shall prevent loss of detention basin volume caused by sedimentation.

Detention basin shall be cleaned of sediment when 1 foot of sediment accumulates in the pond.

- Gauges located at the opposite ends of the detention basin shall be maintained to monitor sedimentation.
- Gauges shall be checked two times per year.
- Sources of restricted sediment or debris, such as discarded lawn clippings, shall be identified and prevented.
- Debris in quantities sufficient to inhibit operation shall be removed routinely, e.g., no less than quarterly or upon discovery.
- Litter shall be removed upon discovery.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices, consistent with the maintenance of a stormwater quality facility, shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced within as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining ponds shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

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5. Detention Basin (continued)

Access to the detention basin shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the detention basin shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the detention basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

If used at this site, the following will be applicable:

Signage shall clearly convey information.

- Broken or defaced signs shall be replaced or repaired.

Fences shall be maintained to preserve their functionality and appearance.

- Collapsed fences shall be restored to an upright position.
- Jagged edges and damaged fences shall be repaired or replaced.

Inspection Comments: _____

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6. Subsurface Gravel Treatment Wetland

Subsurface Gravel Treatment Wetlands remove pollutants through several processes: sedimentation, filtration, and biological processes.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Pretreatment Sump shall remove coarse debris and sediment entering the treatment wetland

- Sediment depth in pretreatment sump shall be measured quarterly

Sediment shall be removed from pretreatment device as per manufacturers recommendations or when it is a maximum of 1' below the outlet pipe Inspection Comments: _____

Wetland inlet shall ensure unrestricted stormwater flow to the wetland.

- Inlet pipe shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Determine if pipe is in good condition:
 - o If more than 4 inches of settlement, add fill material and compact soils.
 - o If alignment is faulty, correct alignment.
 - o If cracks or openings exist indicated by evidence of erosion at leaks, repair or replace pipe as needed.

Inspection Comments: _____

Forebay traps coarse sediments, reduces incoming velocity, and distributes runoff evenly over the wetland.

- Sediment exceeding 3 inches in depth, or so thick as to damage or kill vegetation, shall be removed.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures.

Inspection Comments: _____

Embankment, dikes, berms, and side slopes retain water in the wetland.

- Slopes shall be stabilized using appropriate erosion control measures when soil is exposed or erosion channels are forming.
- Structural deficiencies shall be corrected upon discovery:
 - o If cracks exist, repair or replace structure.
 - o If erosion channels deeper are noted, stabilize surface. Sources of erosion damage shall be identified and controlled.
- Rip rap or other erosion control methods shall be inspected and replaced as necessary

Inspection Comments: _____

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6. Subsurface Gravel Treatment Wetland (continued)

Stand Pipes shall direct flow to the subsurface gravel chamber

- Structural deficiencies shall be corrected upon discovery:
- If cracks exist, repair or replace structure.
- Pipe caps shall be in place at all times.

Inspection Comments: _____

Perforated Underdrain Pipe shall insure unrestricted movement of water through the gravel layer.

- If cracks exist, repair or replace pipe.
- Pipe shall be cleaned as necessary to insure free movement of water

Inspection Comments: _____

Overflow structure conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow structure shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Sources of erosion damage shall be identified and controlled when soil is exposed at the top of overflow structure or erosion channels are forming.
- Rocks or other armament shall be replaced when only one layer of rock exists above native soil.

Inspection Comments: _____

Sediment and debris management shall prevent loss of wetland volume caused by sedimentation.

- Wetlands shall be cleaned when 1 foot of sediment accumulates.
- Gauges located at the opposite ends of the wetland shall be maintained to monitor sedimentation.
- Gauges shall be checked two times per year.
- Sources of restricted sediment or debris, such as discarded lawn clippings, shall be identified and prevented.
- Debris in quantities sufficient to inhibit operation shall be removed routinely, e.g., no less than quarterly or upon discovery.
- Litter shall be removed upon discovery.

Inspection Comments: _____

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6. Subsurface Gravel Treatment Wetland (continued)

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices, consistent with the maintenance of a stormwater quality facility shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining treatment wetlands shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the wetland shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the wetland shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

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7. Constructed Treatment Wetland

Constructed treatment wetlands remove pollutants through several processes: sedimentation, filtration, and biological processes.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ___/___/_____ Inspector's Name: _____

Wetland inlet shall ensure unrestricted stormwater flow to the wetland.

- Inlet pipe shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Determine if pipe is in good condition:
 - If more than 4 inches of settlement, add fill material and compact soils.
 - If alignment is faulty, correct alignment.
 - If cracks or openings exist indicated by evidence of erosion at leaks, repair or replace pipe as needed.

Inspection Comments: _____

Forebay traps coarse sediments, reduces incoming velocity, and distributes runoff evenly over the wetland.

A minimum 1-foot freeboard shall be maintained.

- Sediment exceeding 3 inches in depth, or so thick as to damage or kill vegetation, shall be removed.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures.

Inspection Comments: _____

Embankment, dikes, berms, and side slopes retain water in the wetland.

- Slopes shall be stabilized using appropriate erosion control measures when soil is exposed or erosion channels are forming.
- Structural deficiencies shall be corrected upon discovery:
 - If cracks exist, repair or replace structure.
 - If erosion channels deeper are noted, stabilize surface. Sources of erosion damage shall be identified and controlled.

Inspection Comments: _____

Control devices (e.g., weirs, baffles, etc.) shall direct and reduce flow velocity.

- Structural deficiencies shall be corrected upon discovery:
- If cracks exist, repair or replace structure.

Inspection Comments: _____

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7. Constructed Treatment Wetland (continued)

Overflow structure conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow structure shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- Sources of erosion damage shall be identified and controlled when soil is exposed at the top of overflow structure or erosion channels are forming.
- Rocks or other armament shall be replaced when only one layer of rock exists above native soil.

Inspection Comments: _____

Sediment and debris management shall prevent loss of wetland volume caused by sedimentation.

Wetlands shall be cleaned when 1 foot of sediment accumulates.

- Gauges located at the opposite ends of the wetland shall be maintained to monitor sedimentation.
- Gauges shall be checked two times per year.
- Sources of restricted sediment or debris, such as discarded lawn clippings, shall be identified and prevented.
- Debris in quantities sufficient to inhibit operation shall be removed routinely, e.g., no less than quarterly or upon discovery.
- Litter shall be removed upon discovery.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices, consistent with the maintenance of a stormwater quality facility shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining treatment wetlands shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

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7. Constructed Treatment Wetland (continued)

Access to the wetland shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the wetland shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

If used at this site, the following will be applicable:

Signage shall clearly convey information.

- Broken or defaced signs shall be replaced or repaired.

Fences shall be maintained to preserve their functionality and appearance.

- Collapsed fences shall be restored to an upright position.
- Jagged edges and damaged fences shall be repaired or replaced.

Inspection Comments: _____

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8. Manufactured Treatment Technology

Manufactured treatment technologies are proprietary facilities that can be used to meet the stormwater treatment requirements, provided the type of facility has been approved by the City. The *Public Works Design Standards* lists approved facilities. Because requirements vary among the different types of facilities, each facility is to be operated and maintained according to the specifications provided by the manufacturer

Date: ____/____/____ Inspector's Name: _____

- Manufactured treatment devices are being maintained according to manufacturer specifications as approved by the City.
- Records of operations/maintenance are being kept on file.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining manufactured treatment technology shall be provided to all property owners and tenants.

Inspection Comments: _____

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9. Green Roof

The City will review green roof submittals on a case-by-case basis.

Green roofs are vegetated roof systems that retain and filter stormwater and provide aesthetic and energy conservation benefits. All facility components, including soil substrate or growth medium, vegetation, drains, irrigation systems (if applicable), membranes, and roof structure shall be inspected for proper operations, integrity of the waterproofing, and structural stability throughout the life of the green roof or roof garden. All elements shall be inspected once a month from April through September. The facility owner must keep a log recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Soil substrate/growing medium shall be inspected for evidence of erosion from wind or water.

- If erosion channels are evident, they shall be stabilized with additional soil substrate/growth medium and covered with additional plants.

Inspection Comments: _____

Green roof system structural components shall be operated and maintained in accordance with manufacturer's requirements. Drain inlets shall be kept unrestricted.

- Inlet pipe shall be cleared when soil substrate, vegetation, debris, or other materials clog the drain inlet. Sources of sediment and debris shall be identified and corrected.
- Determine if drain inlet pipe is in good condition and correct as needed.

Inspection Comments: _____

Debris and litter shall be removed to prevent clogging of inlet drains and interference with plant growth.

Inspection Comments: _____

Vegetation shall be maintained to provide 90 percent plant cover.

- During the establishment period, plants shall be replaced once per month as needed. During the long-term period, dead plants shall generally be replaced once per year in the fall months.
- Fallen leaves and debris from deciduous plant foliage shall be removed.
- Nuisance and prohibited vegetation from the Salem Plant List shall be removed when discovered.
- Dead vegetation shall be removed and replaced with new plants.
- Weeding shall be manual with no herbicides or pesticides used. Weeds shall be removed regularly and not allowed to accumulate.
- Fertilization is not necessary and fertilizers shall not be applied.
- During drought conditions, mulch or shade cloth may be applied to prevent excess solar damage and water loss.
- Mowing of grasses shall occur as needed. Clippings shall be removed.

Inspection Comments: _____

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9. Green Roof (continued)

Irrigation can be accomplished either through hand watering or automatic sprinkler systems. If automatic sprinklers are used, manufacturer's instructions for operations and maintenance shall be followed.

- During the establishment period (one to three years), water sufficient to assure plant establishment and not to exceed ¼-inch of water once every 3 days shall be applied.
- During the long-term period (three years and more), water sufficient to maintain plant cover and not to exceed ¼-inch of water once every 14 days shall be applied.

Inspection Comments: _____

Spill prevention measures from mechanical systems located on roofs shall be exercised when handling substances that can contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining green roofs shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement: _____

Access and safety to the green roof shall be safe and efficient.

- Egress and ingress routes shall be maintained to design standards. Walkways shall be clear of obstructions and maintained to design standards.

Inspection Comments: _____

Aesthetics of the green roof shall be maintained as an asset to the property owner and community.

- Evidence of damage or vandalism shall be repaired and accumulation of trash or debris shall be removed upon discovery.

Inspection Comments: _____

Nuisance insects shall not be harbored at the green roof.

- Standing water creating an environment for development of insect larvae shall be eliminated by manual means. Chemical sprays shall not be used.

Inspection Comments: _____

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10. Sand Filter

Sand filters consist of a layer of sand in a structural box used to trap pollutants. The water filters through the sand and then flows into the surrounding soils or an underdrain system that conveys the filtered stormwater to a discharge point. All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/_____ Inspector's Name: _____

Filter inlet shall allow water to uniformly enter the sand filter as calm flow, in a manner that prevents erosion.

- Inlet shall be cleared of sediment and debris when 40 percent of the conveyance capacity is plugged.
- Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- Rock splash pads shall be replenished to prevent erosion.

Inspection Comments: _____

Reservoir receives and detains stormwater prior to infiltration. If water does not drain within two to three hours of storm event, sources of clogging shall be identified and corrective actions taken.

- Debris in quantities more than 1 cubic foot or sufficient to inhibit operation shall be removed no less than quarterly or upon discovery.
- Structural deficiencies in the sand filter box including rot, cracks, and failure shall be repaired upon discovery.

Inspection Comments: _____

Filter media shall allow stormwater to percolate uniformly through the sand filter. If water remains 36 to 48 hours after storm, sources of possible clogging shall be identified and corrected.

- Sand filter shall be raked and, if necessary, the sand/gravel shall be excavated and cleaned or replaced.
- Sources of restricted sediment or debris (such as discarded lawn clippings) shall be identified and prevented.
- Debris in quantities sufficient to inhibit operation shall be removed no less than quarterly or upon discovery.
- Holes that are not consistent with the design structure and allow water to flow directly through the sand filter to the ground shall be filled.

Inspection Comments: _____

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10. Sand Filter (continued)

Underdrain piping (where applicable) shall provide drainage from the sand filter, and **Cleanouts** (where applicable) located on laterals and manifolds shall be free of obstruction and accessible from the surface.

- Underdrain piping shall be cleared of sediment and debris when conveyance capacity is plugged. Cleanouts may have been constructed for this purpose.
- Obstructions shall be removed from cleanouts without disturbing the filter media.

Inspection Comments: _____

Overflow or emergency spillway conveys flow exceeding reservoir capacity to an approved stormwater receiving system.

- Overflow spillway shall be kept clear at all times.
- Source of erosion damage shall be identified and controlled when erosion channels are forming.
- Rocks or other armament shall be replaced when sand is exposed and eroding from wind or rain.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices, consistent with the maintenance of a stormwater quality facility, shall be employed to ensure that plants are vigorous and healthy.

- Mulch shall be replenished as needed, but not inhibiting water flow.
- Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- Dead vegetation shall be removed upon discovery.
- Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater infiltration and to prevent clogging.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

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10. Sand Filter (continued)

Training and/or written guidance information for operating and maintaining sand filters shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the sand filter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the facility shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the infiltration basin. Pest control measures shall be taken when nuisances insects/rodents are found to be present.

- Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

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11. Pervious Pavement

Pervious pavement is a permeable pavement surface with an underlying stone reservoir that temporarily stores surface runoff before infiltrating into the subsoil or being collected in underlying drain pipes and being discharged off-site. There are many types of pervious pavement including plastic rings planted with grass, stone or concrete blocks with pore spaces backfilled with gravel or sand, porous asphalt, and porous concrete.

Inspections

All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Surface: In most pervious pavement design, the pavement itself acts as pretreatment to the stone reservoir below. The surface shall be kept clean and free of leaves, debris, and sediment. The surface shall not be overlaid with an impermeable paving surface

- Regular sweeping shall be implemented for porous asphalt or concrete systems.

Inspection Comments: _____

Overflows or emergency spillways are used in the event the facility's infiltration capacity is exceeded.

- Overflow devices shall be inspected for obstructions or debris, which shall be removed upon discovery.
- Overflow or emergency spillways shall be capable of transporting high flows of stormwater to an approved stormwater receiving system.
- Sources of erosion damage shall be identified and controlled when native soil is exposed near the overflow structure.

Inspection Comments: _____

Vegetation (where applicable) shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Vegetation, such as trees and shrubs, should not be located in or around the pervious pavement because roots from trees can penetrate the pavement, and leaves from deciduous trees and shrubs can increase the risk of clogging the surface.

- Vegetation and large shrubs/trees that limit access or interfere with porous pavement operation shall be pruned.
- Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- Poisonous, nuisance, dead, or odor-producing vegetation shall be removed immediately.
- Grass shall be mowed to less than 4 inches and grass clippings shall be bagged and removed.
- Irrigation shall be provided as needed.

Inspection Comments: _____

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11. Pervious Pavement (continued)

Source control measures must be taken to prevent pollutants from mixing with stormwater. Typical nonstructural control measures include:

- Raking and removing leaves
- Street sweeping
- Vacuum sweeping.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining vegetated infiltration basins shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the pervious pavement shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the porous pavement shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Debris and litter shall be removed to prevent clogging.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored at the pervious pavement. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

Holes in the ground located in and around the pervious pavement shall be filled and compacted.

Inspection Comments: _____

If used at this site, the following will be applicable:

Signage may serve to educate people about the importance or function of the site's stormwater protection measures. It may also discourage behaviors that adversely affect stormwater protection measures. For example, if debris is a problem, a sign reminding people not to litter may partially solve the problem. Broken or defaced signs shall be replaced/repared.

Inspection Comments: _____

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12. Underground Detention Tank, Vault, and Pipe

Underground detention tanks, vaults, and pipes are designed to fill with stormwater during large storm events, slowly releasing it over a number of hours. There are numerous components to each system.

Drain inlet pipes convey stormwater into the detention facility. The **detention chamber** is the structure in which stormwater accumulates during a storm event. **Orifice structure/outlet drain pipe** restricts the flow out of the detention chamber, allowing it to fill up and slowly drain out. The orifice structure is located at the downstream end of the detention chamber.

Inspections

Underground facility inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter. It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained:

Date: ____/____/____ Inspector's Name: _____

Drain inlet pipes shall be inspected for clogging or leaks where it enters the vault or basin during every inspection and cleanout.

- Debris/sediment that is found to clog the inlet shall be removed, tested, and disposed of in accordance with applicable federal and state requirements.

Inspection Comments: _____

Detention chamber shall be inspected for cracks or damage during each inspection.

- The detention chamber shall be cleaned out yearly or after an inch of sediment has accumulated. If there is a valve on the outlet pipe, it shall be closed, otherwise, the outlet shall be plugged prior to cleanout. Grit and sediment that has settled to the bottom of the chamber shall be removed during each cleaning.
- Water and sediment in the detention chamber shall be removed, tested, and disposed of in accordance with regulations.
- Cleaning shall be done without use of detergents or surfactants. A pressure washer may be used if necessary.

Inspection Comments: _____

Orifice structure/outlet drain pipe shall be inspected for clogging during unit inspections/cleanouts.

- Debris/sediment that is found to clog the inlet shall be removed, tested, and disposed of in accordance with applicable federal and state requirements.

Inspection Comments: _____

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12. Underground Detention Tank, Vault, and Pipe (continued)

Vegetation such as trees should not be located in or around the detention facility because roots from trees can penetrate the unit body, and leaves from deciduous trees and shrubs can increase the risk of clogging the intake pipe.

- Large shrubs or trees that are likely to interfere with detention facility operation shall be identified at each inspection, and then removed.

Inspection Comments: _____

Source control measures typically include structural and nonstructural controls. Nonstructural controls can include street sweeping and other good housekeeping practices. It is often easier to prevent pollutants from entering stormwater than to remove them.

- Source control measures shall be inspected and maintained (where applicable).

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining vegetated infiltration basins shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the detention facility is required for efficient maintenance.

- Egress and ingress routes shall be open and maintained to design standards.

Inspection Comments: _____

Signage may serve to educate people about the importance or function of the site's stormwater protection measures. Signs may also discourage behavior that adversely impacts the stormwater protection measures and encourages behavior that enhances or preserves stormwater quality. If debris is a problem, a sign reminding people not to litter may partially solve the problem.

- Signage (where applicable) will be maintained and repaired as needed during or shortly after inspections.

Inspection Comments: _____

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13. Conveyance: Piped

Conveyance (pipes) system shall be routinely inspected and cleaned on a scheduled cycle.

Inspection should consist of cleaning main line followed by TV inspection. Manholes and catch basins should be visually inspected annually and cleaned when sediment has reached 12 inches in depth or 50 percent of capacity has been taken.

- Structural deficiencies shall be corrected upon discovery:
- If cracks exist, repair or replace structure.

Date: ____/____/____ Inspector's Name: _____

Access to the conveyance system shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the conveyance system shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Debris and litter shall be removed to prevent clogging.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining closed channel conveyance systems shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

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14. Conveyance: Open Channel

Open conveyance (ditches) systems shall be inspected annually for sedimentation loading. If sedimentation loading has reached a level in which conveyance is restricted to more than 30 percent, sediment shall be removed. Sedimentation removal shall be done in the least invasive manner. Only remove sediment from bottom of ditch while leaving as much vegetation on banks to prevent erosion. Once removal has taken place, erosion control measures shall be taken by placing straw wattles or other erosion control measures.

Date: ____/____/____ Inspector's Name: _____

Access to the open channel system shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the open channel system shall be removed.
- Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Debris and litter shall be removed to prevent clogging.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining open channel conveyance systems shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the open channel system. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the detention facility shall be filled.

Inspection Comments: _____

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15. Soakage Trench

Soakage trenches consist of drain rock and sand, and receive stormwater from roof downspouts and/or area drains. There are various components within the system—piping, silt basin, and the trench itself. The **conveyance piping** consists of an inlet pipe (downspout or area drain), an outlet pipe located between the silt basin and the soakage trench, and a perforated pipe located on top of the aggregate bed of the soakage trench. The **silt basin** is a structure receiving runoff from an inlet pipe and conveying it to the soakage trench. The silt basin serves as the pretreatment system for the soakage trench, removing sediments and other debris that can impact its proper functioning. All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Soakage trench infiltration: If water is noticed on top of the trench within 48 hours of a major storm, the soakage trench may be clogged.

- Check for debris/sediment accumulation, rake and remove, and evaluate upland causes (erosion, surface or roof debris, etc.)
- Assess the condition of the aggregate and the filter fabric in the trench. If there is sediment in the aggregate, excavate and replace.
- If there is a tear in the filter fabric, repair or replace.

Inspection Comments: _____

Conveyance piping: If water ponds over the trench for more than 48 hours after a major storm and no other cause is identified, it may be necessary to remove the filter fabric to determine if the perforated pipe is clogged with sediment or debris.

- Any debris or algae growth located on top of the soakage trench should be removed and disposed of properly.
- If the piping has settled more than 1 inch, add fill material. If there are cracks or releases, replace or repair the pipe. If there are signs of erosion around the pipe, this may be an indication of water seeping due to a crack or break.

Inspection Comments: _____

Silt basin: If water remains in the soakage trench for 36 to 48 hours after a storm, check for sediment accumulation in the silt basin.

- If less than 50 percent capacity remains in the basin or 6 inches of sediment has accumulated, remove and dispose of the sediment.

Inspection Comments: _____

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15. Soakage Trench (continued)

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

A **shutoff valve or flow-blocking mechanism** may have been required with the construction of the soakage trench to temporarily prevent stormwater from flowing into it in the event of an accidental toxic material spill. This may also involve mats kept on-site that can be used to cover inlet drains in parking lots. The shutoff valve shall remain in good working order, or if mats or other flow-blocking mechanisms are used, they shall be kept in stock on-site.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining soakage trenches shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the soakage trench is required for efficient maintenance. Egress and ingress routes will be maintained to design standards at inspections.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the soakage trench. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the soakage trench shall be filled.

Inspection Comments: _____

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16. Drywell

Drywells are designed to infiltrate stormwater into the ground. Stormwater is piped to drywells from roof downspouts or pollution control facilities such as swales or planters. The pollution control facility, which must be properly operated, inspected, and maintained, is designed to settle out sediments and separate oils and greases from the stormwater before releasing it through a pipe into the drywell. This prolongs the life of the drywell and helps to prevent the contamination of soils and groundwater. The drywell is a concrete or plastic manhole section with many small holes in the sides to allow stormwater to infiltrate into the surrounding soil. *Drywells should be inspected, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/____ Inspector's Name: _____

Stormwater drain pipe shall be inspected for clogging or leaks where it enters the drywell.

- Debris/sediment that is found to clog the pipe shall be removed and disposed of in accordance with applicable federal and state requirements.

Inspection Comments: _____

Drywell shall be inspected during each cleanout. Ponding around the catch basins, sedimentation manhole, or drywell lids may indicate that the drywell is failing due to siltation or clogging of the sediment pores surrounding the drywell.

- Clogged drywells must be replaced.

Inspection Comments: _____

Vegetation such as trees should not be located in or around the drywell because roots from trees can penetrate the unit body, and leaves from deciduous trees and shrubs can increase the risk of clogging the intake pipe.

- Large shrubs or trees that are likely to interfere with operation will be identified at each inspection and removed.

Inspection Comments: _____

Source control measures typically include structural and nonstructural controls. Nonstructural controls can include parking lot or street sweeping and other good housekeeping practices. It is often easier to prevent pollutants from entering stormwater than to remove them.

- Source control measures shall be inspected and maintained (where applicable).

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

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16. Drywell (continued)

A shutoff valve or flow-blocking mechanism may have been required with the construction of the drywell to temporarily prevent stormwater from flowing into it in the event of an accidental toxic material spill. This may also involve mats kept on-site that can be used to cover inlet drains in parking lots. The shutoff valve shall remain in good working order, or if mats or other flow-blocking mechanisms are used, they shall be kept in stock on-site.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining drywell systems shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the drywell is required for efficient maintenance. Egress and ingress routes shall be open and maintained to design standards.

Inspection Comments: _____

Nuisance insects and rodents shall not be harbored in the drywell. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- Holes in the ground located in and around the drywell shall be filled.

Inspection Comments: _____

Signage may serve to educate people about the importance or function of the site's stormwater protection measures. Signs may also discourage behavior that adversely impacts the stormwater protection measures and encourages behavior that enhances or preserves stormwater quality. If debris is a problem, a sign reminding people not to litter may partially solve the problem.

- Signage (where applicable) shall be maintained and repaired as needed during or shortly after inspections.

Inspection Comments: _____
