

Chapter 3. OPERATIONS AND MAINTENANCE

This chapter establishes operations and maintenance (O&M) requirements for the stormwater management facilities and conveyance features implemented or protected through the requirements of the *Stormwater Management Manual*. O&M requirements for stormwater facilities and conveyance features on private property are presented in Section 3.1. Requirements for public stormwater facilities, either in the public-right-of-way or otherwise publicly owned, are presented in Section 3.2.

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3.1 Operations and Maintenance Requirements for Private Property

Onsite stormwater systems, including stormwater management facilities and conveyance features, must be maintained so they function as intended and limit offsite environmental impacts. Owners are required to check their stormwater systems regularly to determine maintenance needs. Routine inspection and maintenance can help keep overall maintenance costs at a minimum by detecting problems early and avoiding large repair or replacement costs. Per the requirements in [Chapter 1](#), operations and maintenance requirements are laid out in an Operations and Maintenance (O&M) Plan.

The key goals for any O&M plan are to:

- Relay information between the designer/engineer and those providing maintenance.
- Identify the onsite stormwater system that's required or impacted by development. Elements include the stormwater management facilities, runoff sources, discharge locations, and stormwater conveyance features such as drainageway and related encroachments, pipes, storm sewers, culverts, and outfalls.
- Provide long-term guidance to prevent system deterioration and failure.
- Define the visual indicators of diminished performance and maintenance requirements for each stormwater management facility and conveyance feature that comprises the onsite stormwater system.
- Provide a schedule for inspection and maintenance to maintain and restore optimal performance.
- Designate property owners or other parties responsible for O&M of the onsite stormwater management system.
- Require inspection and maintenance logs to be filled out by maintenance personnel and kept by the responsible parties.

Stormwater facilities, including associated paths, gates and covers, must be maintained to provide safe, efficient access for maintenance.

Every project on private property with one or more stormwater facilities or conveyance features must submit an [Operations & Maintenance \(O&M\) Form](#) provided in [Section 3.1.4](#). The [O&M Form](#) identifies the site and property owner, the parties responsible for O&M activities, and stormwater facility information. The [O&M Form](#) also provides a space for a simple site plan. If the space is not sufficient for a drawing of the stormwater management system, including conveyance features, a site plan must be attached. The Bureau of Environmental Services may require a more detailed site plan

for plan review if the simple site plan does not clearly identify stormwater facility location and types.

Operations and maintenance requirements will vary, based on how the facility is designed and if there are natural or constructed conveyance features.

- The submittal for stormwater management facilities designed with the Simplified or Presumptive Approach must include the standard O&M plan provided in [Section 3.1.1](#). Every facility type used must be represented by the standard O&M plan for that facility type.
- The submittal for stormwater management facilities designed with the Performance Approach must include a site-specific O&M Plan as presented in [Section 3.1.2](#).
- The submittal for natural or constructed conveyance features such as drainageways, drainage reserves, drainage reserve easements, culverts, or outfalls must include the appropriate O&M plan provided in [Section 3.1.3](#). This is in addition to the stormwater management facility requirements, which are specific to the design approach.

Submittal requirements for private property and the [O&M Form](#) are found in [Section 3.1.4](#).

3.1.1 Simplified and Presumptive Approach Maintenance Requirements

When the Simplified or Presumptive Approach is used to design stormwater management facilities, the required O&M submittal to BES is:

- A Standard O&M Plan for each facility type included in the permitted development;
- A completed [O&M Form](#) that has been recorded with the appropriate county. A Site Plan (either sketched or attached) must be included.

The property owner or responsible party must keep a copy of the recorded [O&M Form](#) and the appropriate O&M plans. Operations and maintenance practices must be consistent with the version of the Stormwater Management Manual that was in effect when the original [O&M Form](#) was filed, or consistent with the most current O&M practices and guidance for the facilities. The property owner is responsible for ensuring that the maintenance is completed and records are kept, even if someone other than the property owner is performing the maintenance, such as a facility manger or maintenance company.

The following Standard O&M plans are for facilities designed with the Simplified and Presumptive Approaches.

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.1. Ecoroofs

Note: If the installed ecoroof is a proprietary system, then the O&M requirements for the system supersede this plan.

Structural components, including the waterproof membrane, must be operated and maintained in accordance with the manufacturer's specifications and design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged drains	Remove sediment and debris if necessary.
Tears or perforation of membrane	Repair any leaks or structural deficiencies; contact manufacturer for repair or replacement.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original planting plan, or substitute from the plant list in Section 2.4.1 .
Dry grass or other plants	Trim dry grasses and remove clippings.
Weeds	Manually remove weeds before they go to seed.
Growing medium must sustain healthy plant cover and drain within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Exposed soil	Cover with plants and mulch as needed.
Eroded soils and gullies	Fill, hand tamp, or lightly compact and plant to disperse flow.
Crusting, dry, or shrinking medium	Rake or amend to restore infiltration or flow.
Ponding or excessive moisture	Amend soils and clear drains. Check irrigation system for leaks.

Annual Maintenance Schedule

Summer	Make necessary repairs. Improve growing medium as needed. Irrigate as needed.
Fall	Replant areas of exposed soil, replace dead plants. Provide erosion control for bare soil.
Winter	Monitor infiltration/flow-through rates.
Spring	Replant areas of exposed soil and replace dead plants
All seasons	Weed as necessary. Clean drains as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides: Their use is strongly discouraged because of the potential for negative impacts to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Irrigation: During the establishment period (up to 3 years), irrigation must not exceed ½ inch of water every 10 days, regardless of water source. Post-establishment irrigation must not exceed ¼ inch of water every 14 days (May through October), regardless of water source. Consider installing an irrigation flow meter for ecoroofs greater than 5,000 square feet. Test the irrigation system for leaks annually. Make sure irrigation piping is covered by at least 2" of soil at all times.

Infiltration/Flow Control: Ecoroofs must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent the introduction of pollutants into stormwater. Record the time/date, weather, and site conditions when site activities contaminate stormwater. Record the time/date and description of corrective action taken.

Vectors (Mosquitoes and Rats): Ecoroofs must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed			Notes	Initials
		Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.2. Pervious Pavement

Note: If this is a proprietary system, the O&M requirements for the system supersede this plan.

Structural components, including surface materials, must evenly infiltrate stormwater.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged surface	Vacuum or dry sweep at least once a year.
Unraveling or settled pavement	Repair as per manufacturer specification. Do not apply sealants to pervious pavement.
Vegetation must be managed to reduce impacts to pervious pavement.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Leaf debris	Sweep leaf litter and sediment to prevent surface clogging and ponding.
Vegetation encroachment	Prevent large root systems from damaging subsurface structural components.
Weeds	Manually remove, mow, or torch weeds.
Filter medium must be maintained to preserve infiltration capacity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Aggregate loss	Replace paver pore space with aggregate per original design.

Annual Maintenance Schedule

Summer	Make structural repairs.
Fall	Vacuum sweep.
Winter	Monitor infiltration rates.
Spring	Vacuum sweep.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent the introduction of pollutants into stormwater. Record the time/date, weather, and site conditions when site activities contaminate stormwater. Record the time/date and description of corrective action taken.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed	Notes	Initials

STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

3.1.1.3. Trees

Trees must be maintained per the approved plan.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed tree	<ul style="list-style-type: none">• Replant per original planting plan, or substitute from the plant list in Section 2.4.1.• Irrigate as needed.• Mulch or amend soil as needed.• Prune branches and dead limbs and remove clippings.• Manually remove weeds. Do not use pesticides.

Annual Maintenance Schedule

All seasons	Mulch or amend soil as needed. Prune tree as necessary to protect sight lines. Irrigate and weed as needed. Inspect trees for damage and disease.
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Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all landscape maintenance. Keep work orders and invoices on file and make them available upon request of the City inspector.

Planting and Irrigation: Consult Portland Parks and Recreation’s website (“Urban Street Tree Planting Standards”) for guidance about planting and irrigation. Irrigation is required during the establishment period to ensure tree survival. Hand watering is preferred, but a drip irrigation system may also be used. Long-term irrigation is not required.

Pruning: Pruning is allowed only for safety reasons and the health of the tree; however, pruning is allowed adjacent to a building if it is needed to protect the structure. Consult Portland Parks and Recreation’s website for information about permit requirements for pruning.

Tree Removal: Trees must be maintained and protected after construction and for the life of the development (50 to 100 years or until any approved redevelopment occurs). During the life of the development, trees approved for stormwater credit must not be removed without approval from BES and approval may be required by Portland Parks and Recreation’s Urban Forestry group. Trees that are removed or die must be replaced within 6 months with like-species or alternatives approved by BES.

Vectors (Mosquitoes and Rats): Trees must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the structure of the facility. Contact the county vector control group for guidance.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed	Notes	Initials

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.4. Downspout Extensions

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged gutters, drains, or downspouts	Remove sediment, debris, and blockages from downspouts, gutters, and pipes to maintain at least 50% conveyance at all times. Cleaning twice a year or more is recommended depending on the presence of overhanging trees.
Damaged or missing pipes, gutters, and downspouts	Repair or replace broken gutters and downspouts as needed. Identify possible leaks and verify that roof flashing directs water into gutters. Look for low spots or sagging areas along the gutter line and repair as needed with new hangers.
Blocked downspout extension	Clear downspout elbows of debris. Clear any build-up of soil, bark dust, and/or vegetative growth from around downspout extensions and/or splash blocks. Verify there is sufficient slope so water flows away from the foundation.
Vegetation	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original plan, or substitute from the plant list in Section 2.4.1 .
Dry grass or other plants	Irrigate and mulch as needed. Maintain grass height at 6"-9".
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soils, sediment	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from the plant list in Section 2.4.1 . Any erosion deeper than 2" must be addressed. Sediment deeper than 4 inches must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.

Annual Maintenance Schedule

Summer	Make structural repairs. Clean gutters and downspouts. Remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts to maintain conveyance.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and cleaning activities. Keep work orders and invoices on file and make them available upon request by the City inspector.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement best management practices to prevent the introduction of pollutants into stormwater. Record the time/date, weather, and site conditions when site activities contaminate stormwater. Record the time/date and description of the corrective action taken.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity is observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed				Notes	Initials
		Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.5. Rain Gardens

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged gutters, drains, downspouts, or inlets	Remove sediment, debris, and blockages from downspouts, gutters, pipes, and inlets to maintain at least 50% conveyance at all times. Clean at least twice a year depending on the presence of overhanging trees. Clear any build-up of soil, bark dust, and/or vegetative growth from around downspout extension and/or splash blocks. Verify there is sufficient slope so that water flows away from the foundation.
Damaged or missing pipes, gutters, and downspouts	Repair or replace broken gutters and downspouts as needed. Identify possible leaks and verify that roof flashing directs water into gutters. Look for low spots or sagging areas along the gutter line and repair as needed with new hangers.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Remove dead material; replant per original planting plan, or substitute from the plant list in Section 2.4.1 .
Dry grass or other plants	Irrigate and mulch as needed. Maintain grass height at 6"-9".
Weeds	Manually remove weeds
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soils, sediment accumulation	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from the plant list in Section 2.4.1 . Any erosion deeper than 2 inches must be addressed. Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate
Ponding	Till, amend, or rake soil as needed to ensure ponding water drains within 48 hours.

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides: Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

3.1.1.6. Swales

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes; maintain at least 50% conveyance at all times.
Broken inlets or outlets	Repair or replace broken downspouts, curb cuts, standpipes, and screens as needed.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage.
Check dams missing or with gaps	Maintain or replace check dams as per design specifications.
Perforated liner	Repair or replace as necessary.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per planting plan or substitute from the plant list in Section 2.4.1 .
Dry grass or other plants	Irrigate and mulch. Maintain grass height at 6"-9".
Tall grass and vegetation	Prune to allow sight lines and foot traffic. Prune to ensure inlets and outlets freely convey stormwater into and/or out of facility.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Erosion and sediment accumulation	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6); replant according to planting plan or substitute from the plant list in Section 2.4.1 . Erosion deeper than 2 inches must be addressed. Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Slope slippage	Stabilize 3:1 slopes/banks with plantings from the original planting plan or from the plant list in Section 2.4.1 .
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate.

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides. Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE PRESUMPTIVE APPROACH

3.1.1.7. Curb Extensions

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment, debris, and blockages from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance at all times. Sediment deeper than 4 inches must be removed.
Broken inlets or outlets	Repair or replace broken downspouts, curb cuts, standpipes, and screens as needed.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage.
Check dams missing or with gaps	Maintain or replace rock check dams as per design specifications.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per planting plan, or substitute from the plant list in Section 2.4.1 .
Dry grass or other plants	Irrigate and mulch; prune tall, dry grasses and remove clippings.
Tall grass and vegetation	Trim to ensure inlets and outlets freely convey stormwater, and to allow sight lines and foot traffic. Maintain grass height at 6"-9".
Weeds	Manually remove weeds
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies or exposed soils	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from the plant list in Section 2.4.1 . Erosion deeper than 2 inches must be addressed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Slope slippage	Stabilize 3:1 slopes/banks with plantings from the plant list in Section 2.4.1 .
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate. Remove sediment at entrances.

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: Facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all activities. File work orders and invoices and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides: Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

3.1.1.8. Planters

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes; maintain at least 50% conveyance at all times.
Broken inlets or outlets	Repair/replace broken downspouts, curb cuts, standpipes, and screens.
Damaged liners and walls	Extend and secure liner to planter walls above the high water mark. The facility must be water tight to protect abutting foundations from moisture damage.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original planting plan, or substitute from the plant list in Section 2.4.1 . Irrigate and mulch as needed; prune tall, dry grasses and remove clippings.
Tall grass and vegetation	Maintain grass height at 6"-9". Trim to allow sight lines and foot traffic, also to ensure inlets and outlets freely convey stormwater into and/or out of facility.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soils, sediment accumulations	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from the plant list in Section 2.4.1 . Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate. Remove and replace sediment at entrances.

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides: Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine facility structures. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

3.1.1.9. Basins

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment, debris, and blockages from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance at all times
Broken inlets or outlets, including grates	Repair or replace broken downspouts, curb cuts, standpipes, and screens as needed.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage.
Check dams missing/broken	Maintain or replace rock check dams as per design specifications.
Perforated liner	Replace or repair liner as needed.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original planting plan, or substitute from the plant list in Section 2.4.1 . Irrigate and mulch as needed; prune tall, dry grasses and remove clippings.
Tall grass and vegetation	Maintain grass height at 6"-9". Trim to allow sight lines and foot traffic, also to ensure inlets and outlets freely convey stormwater into and/or out of facility.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soil, sediment accumulation	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from the plant list in Section 2.4.1 . Erosion more than 2 inches deep must be addressed. Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Slope slippage	Stabilize 3:1 slopes/banks with plantings from the original planting plan or from the plant list in Section 2.4.1 .
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate. Remove sediment at entrance.

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides. Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Facilities must not harbor mosquito larvae or rodents. Record the time/date, weather, and site conditions when vector activity is observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.10. Filter Strips (Vegetated Filters)

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Ineffective flow spreader	Repair structure to evenly disperse flow.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per planting plan, or substitute from Section 2.4.1 plant list.
Dry grass or other plants	Irrigate and mulch as needed; trim tall grasses and remove clippings. Maintain grass height at 6"-9".
Tall grass and vegetation	Prune to allow sight lines.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, or exposed soils	Fill in and lightly compact areas of erosion with City-approved soil mix (see Section 2.3.6) and replant according to planting plan or substitute from Section 2.4.1 Plant list. Erosion deeper than 2 inches must be addressed.
Slope slippage	Stabilize slopes with plantings from the plant list in Section 2.4.1 .

Annual Maintenance Schedule

Summer	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
Fall	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter	Clear gutters and downspouts.
Spring	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
All seasons	Weed as necessary.

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Fertilizers/Pesticides/Herbicides: Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

Access: Maintain ingress/egress per design standards.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed				Notes	Initials
		Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

STANDARD O&M PLAN FOR THE SIMPLIFIED APPROACH

3.1.1.11. Drywells and Soakage Trenches

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets, manholes, catch basins, or silt traps	Clean gutters, rain drains, catch basins, or silt traps at least twice a year. Remove sediment, debris, and blockages from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance at all times.
Cracked drain pipes, catch basins or manholes	Repair or seal cracks. Replace when repair is insufficient.
Vegetation encroachment	Prevent large root systems from trees and bushes from damaging subsurface structural components.
Ponding water	Remove sediment and debris from all accessible components. Repeated ponding in the system may indicate end of facility life. Consult with City prior to decommissioning or replacement activities.

Annual Maintenance Schedule

Summer	Make structural repairs. Clear drains, inlets and catch basins.
Fall	Clean gutters and rain drains; remove sediment and plant debris.
Winter	Monitor infiltration rates.
Spring	Clean gutters and rain drains

Maintenance Records: All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Access: Maintain ingress/egress per design standards.

Infiltration/Flow Control: All facilities must drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

Vectors (Mosquitoes and Rats): Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

Operations and Maintenance Log

Date	Work Performed By	Type of Work	Notes	Initials

3.1.2 Performance Approach Maintenance Requirements

When the Performance Approach is used to design stormwater management facilities on private property, the required O&M submittal to BES is:

- A completed O&M Form that has been recorded with the appropriate county, including a site plan attached to the form.
- A site-specific O&M Plan. The plan defines the O&M procedures, schedule, and persons responsible for implementing and documenting O&M activities. It must fully address the requirements of the site and the proposed stormwater infrastructure, including all stormwater management facilities and conveyance features.

The site-specific O&M Plan is a component of the Stormwater Management Report and must be prepared for review by BES using the outline in Figure 3-1. The plan must include a description of each type of facility servicing the site, the impervious area draining to the facilities, all stormwater conveyance pipes, and the facilities' discharge locations. The plan must also detail the visual indicators and activities necessary to maintain each facility type.

Figure 3-1. O&M Plan Outline

I. Description
<ul style="list-style-type: none"> • Summary of the onsite stormwater system. • Table identifying each stormwater facility and conveyance feature, including stormwater source, square footage managed, and discharge location. • Location of stormwater facilities and conveyance features in relation to permanent structures or landmarks.
II. Inspection and Visual Indicators of Diminished Performance
<ul style="list-style-type: none"> • When and how often the stormwater facilities or conveyance features will be inspected. • Definition of what storm sizes require additional inspections. • Description of visual indicators that would trigger maintenance activities.
III. Maintenance Activities
<ul style="list-style-type: none"> • Specific procedures for each facility type. • Likely deficiencies and corrective actions. • Course of action for unexpected deficiencies. • Site BMPs for effective stormwater management.
IV. Financial Responsibility
<ul style="list-style-type: none"> • Designation and contact information of entity responsible for site operation and maintenance.
V. Inspection and Maintenance Logs
<ul style="list-style-type: none"> • Instructions for maintaining required logs.

I. Description

The summary must adequately describe the overall stormwater management objectives and the responsibilities of the property owner. It must include the Stormwater Hierarchy, specifically whether the managed stormwater is infiltrated onsite or discharged offsite. It must also describe the stormwater system in the area impacted by the development, including details about the function of each stormwater management facility and all natural and constructed conveyance features such as drainageways, culverts, and outfalls.

A table must be included listing each stormwater facility with the facility type, size, location, stormwater source (rooftop, parking lot, or road runoff), source area (square footage), discharge location, and access point.

The site plan must identify the location of each stormwater facility and conveyance feature. Locations must be clarified by measurements from permanent structures or GPS coordinates.

II. Inspection and Visual Indicators of Diminished Performance

All components of the O&M Plan should be inspected at least:

- Quarterly for the first two years.
- Twice a year thereafter.
- Within 48 hours of major rainfall events (defined as more than one inch of rain over a 24-hour period).

For at least the first two years, the design drawings and the O&M Plan should be present during inspections so it is clear how the site should function. The O&M Plan will help the inspector recognize signs of diminished performance. Visual indicators of maintenance needs should be noted for each facility.

III. Maintenance Activities

Each type of stormwater facility and conveyance feature must have its own section that describes the duties required to maintain that facility or feature and keep it in working order. It is expected that variations in facility configurations as well as variations in sources (rooftop, parking lot, or roadway runoff) will result in different procedures. Maintenance indicators and their corrective actions must also be described.

Maintenance activities must also include best management practices specific to site activities and functions to improve system performance. Examples include lot sweeping or catch basin cleaning.

The following sections present different types of maintenance activities that may be necessary in the site-specific O&M Plan. If usual maintenance practices do not resolve issues, professional services may be required.

Site Best Management Practices

Onsite maintenance practices can reduce maintenance needs for stormwater facilities. Good housekeeping procedures such as trash or source control practices can reduce spills and prevent pollutants from entering facilities.

Remove trash, debris and sediment from parking lots and catch basins. Identify sources of visible pollutants or spills and clean up sources to protect the stormwater system. Sweep or vacuum parking lots or other ground-level surfaces. Report all spills that threaten or enter the public sanitary or storm system (503-823-7180).

Sediment and Oil Removal and Disposal

Stormwater facilities are designed to remove pollutants by capturing sediment, dirt, leaves and litter. Removing sediment and oil helps maintain facility infiltration rates, provide good water quality treatment, and prevent clogging and flooding.

In vegetated facilities, sediment should be removed when it reaches a depth of four inches, when the quantity reaches 30 percent of total capacity (as designed or measured) or when accumulated sediment is impeding facility function. Examples include when sediment is damaging vegetation, preventing the facility from draining, blocking inlets or causing bypass.

Remove sediment by hand unless professionals are needed because of confined space entry requirements or the need for a vacuum truck. Dispose of sediment per solid waste disposal requirements. Removing sediment during dry periods is easier because the material weighs substantially less.

Vegetation Management

Healthy plants play important roles: the root systems absorb stormwater, help maintain infiltration rates, prevent erosion, and capture pollutants. Vegetated facilities must be checked for maintenance needs quarterly for the first two years and then twice a year after that.

If a vegetated stormwater facility has bare soil, or if vegetation is stressed, unhealthy, or dead, replant per the approved planting plan and/or address cause of stress. Remove nuisance and invasive plants.

Healthy vegetation must cover at least 90% of stormwater facility surface area. Grass must be mowed to keep it four to nine inches tall. Prune or trim vegetation or roots to

ensure free conveyance of stormwater or improve sight lines. Remove leaves or other debris. Use weed-free mulch to inhibit weeds. Irrigate as needed.

The use of fertilizers and pesticides (including herbicides) is strongly discouraged in stormwater management facilities because of the potential for negative impacts to downstream systems. Integrated Pest Management strategies are encouraged to reduce or eliminate the need for pesticides. If pesticides are required, use the services of a licensed applicator and products approved for aquatic use.

Erosion, Bank Failure, and Channel Formation

Erosion in the flow path, inside or outside a facility, can clog inlets and outlets and reduce both conveyance efficiency and infiltration rates. Forms of erosion include channels, undercutting, scouring, and slumping. Any area with erosion more than two inches deep must be addressed. Install long-term erosion control practices and fill the eroded areas.

Structural Repairs

Structural components control the conveyance of stormwater. Examples include inlets, outlets, trash racks, concrete curbs, retaining walls, manholes and check dams. Repair or replace items when damaged, loose, broken, cracked, or askew. Monitor minor damage such as dents, rust, or minor cracks in concrete for indications of when repair or replacement is required.

Ponding water

Most stormwater facilities are designed to drain in a certain amount of time. The O&M Plan should specify the anticipated ponding depth, infiltration rate, and drawdown time. When the facility does not drain as anticipated, inspect the facility to determine the cause. Clear clogged inlets or outlets, remove sediment that may be preventing infiltration, or add vegetation.

Pests

Stormwater facilities are designed to drain quickly enough to avoid providing breeding areas for pests. If mosquitos are found, the stormwater facility may be ponding water longer than the approved design but also search for nearby sources of standing water. If rodents are found, remove plant debris, fruit or nuts that are providing shelter and food and contact the appropriate county vector control office for trapping and removal.

Safety

Stormwater facilities must be maintained to protect workers, visitors, and the general public. Vegetation should be pruned for adequate visual clearance. Avoid maintenance

in wet weather to reduce potential injuries from slipping and always use appropriate safety gear. Only personnel approved for confined space entry should enter underground stormwater facilities.

Manufactured Stormwater Treatment Technology Maintenance

Operations and maintenance (O&M) of manufactured stormwater treatment technologies (MSTT) are specific to the device and are critical to their performance removing pollutants from runoff. Design and installation of individual devices is done in partnership with the manufacturer, who provides a letter confirming that the device has been sited, sized, and designed appropriately. The project designer is responsible for confirming that any conditions of use from the City of Portland are met.

Each MSTT has a recommended operations and maintenance guide or plan provided by the manufacturer that includes minimum inspection frequencies, maintenance triggers, and typical media replacement frequencies. The specific MSTT operations and maintenance plan must be attached to the Operations and Maintenance Plan.

Changes to pollutant loading or site conditions, spills, localized erosion, or large storm events may require more frequent maintenance visits in order to maintain performance. Minimum maintenance practices or frequencies may require modification in order to maintain MSTT functionality.

Even if the manufacturer includes a maintenance plan or warranty with the device at the time of purchase, ultimate responsibility for operations and maintenance is with the property owner. It is the property owner's responsibility to document completion of maintenance per any maintenance agreement or while under warranty.

IV. Financial Responsibility

The party responsible for current and ongoing O&M activities must be identified. The name of the responsible party must be updated as needed whenever the facility is inspected under BES's [Maintenance Inspection Program \(MIP\)](#).

A facility maintenance fund is recommended for both operating procedures (regular maintenance) and capital procedures (major overhauls or replacement). Costs depend on the characteristics of the facility, the site, and the drainage area. The general recommendation is that annual maintenance costs should be 5 to 10 percent of the facility's total capital cost. Routine scheduled maintenance can help keep costs down by addressing problems before they require major attention.

V. Inspection and Maintenance Logs

Portland City Code requires property owners to keep an Inspection and Maintenance Log. In general, the log must note all inspection dates, the facility components that were inspected, and any maintenance or repairs performed. The property owner is responsible for ensuring that the maintenance is completed and records are kept, even if someone other than the property owner is performing the maintenance, such as a facility manager or maintenance company. City may accept other documentation including work orders, invoices, or receipts in lieu of an inspection and maintenance log. The intent is to demonstrate compliance with O&M requirements.

If there is a maintenance contract with the manufacturer of a manufactured stormwater treatment technology, the manufacturer's maintenance logs must generally include the same type of information and level of detail as required for stormwater management facilities.

Owners who are not sure their maintenance documentation is sufficient can call BES at 503-823-7761 for proposed O&Ms (those still under development review) or 503-823-5600 for existing O&Ms (already constructed facilities) to get review and approval of their forms.

Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed				Notes	Initials
		Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

3.1.3 Stormwater Conveyance Features

Stormwater conveyance features include drainageways, culverts, and outfalls that are used to transport drainage, stormwater and surface waters. Conveyance features serve important hydrologic, hydraulic, and water quality functions for Portland's waterways and stormwater systems.

Drainageways and any related encroachments must be maintained to preserve key watershed processes. In addition to ecological benefits, they provide beneficial functions such as flood attenuation and water quality treatment. Culverts and outfalls must be maintained to minimize negative effects on watershed processes and ecological functions while adequately conveying flows downstream.

The private property owner is responsible for preserving and maintaining conveyance features as protected or constructed to approved plans. Any future development proposals must protect stormwater conveyance features to ensure continuation of flow conveyance and other benefits. Stormwater Conveyance features require an O&M submittal to BES that includes:

- A Standard O&M Plan for conveyance features; and
- A completed O&M Form that has been recorded with the appropriate county. A Site Plan (either sketched or attached) must be included.

O&M submittal requirements are listed in Section 3.1.4. Specific requirements for conveyance features are outlined below.

Drainageways, Drainage Reserves, and related Encroachments

An Operations and Maintenance (O&M) plan is required for drainageways on properties undergoing development proposal review, regardless of whether the drainageway is being impacted by the development proposal. O&M plans are required when drainage reserves are being applied to a drainageway during development proposal review or for a permitted improvement or encroachment to a drainage reserve. Operations and Maintenance Plans must be recorded with an O&M Form in the county of the subject property.

Culverts and Outfalls

An O&M Plan is required for culverts and outfalls on properties undergoing development proposal review, regardless of whether or not the culvert or outfall is directly associated with a stormwater management facility.

STANDARD OPERATIONS AND MAINTENANCE PLAN

3.1.3.1. Drainageway and Drainage Reserves

The limits of the drainage reserve must remain in natural topographic condition.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Existing encroachments or modifications to drainage reserve.	Document existing encroachments (such as fences, rock walls or pipes) on the operations and maintenance site plan.
New encroachments or modifications to the drainageways that have not undergone review or approval.	Remove encroachments and return drainageway to natural topographic condition.
No vegetation in the drainageway or drainage reserve limits can be on Portland's lists of nuisance or prohibited plants.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Nuisance or prohibited plants are discovered within the drainage reserve.	<ul style="list-style-type: none"> • Manually remove weeds. Do not use fertilizers, herbicides or pesticides. • Nuisance and prohibited vegetation from the Portland Plant List (such as Himalayan blackberries and English Ivy) must be removed when discovered. • Invasive vegetation contributing to more than 25% of vegetation of all species must be removed and replaced. • Mulch as needed outside of the drainage channel. Stabilize soils with plants from the Portland Plant List.

STANDARD OPERATIONS AND MAINTENANCE PLAN

3.1.3.2. Drainage Reserve or Channel Encroachment

Natural and structural components, including inlets and outlets/overflows, must freely convey stormwater.		
	MAINTENANCE INDICATOR	CORRECTIVE ACTION
	Clogged inlets or outlets	<ul style="list-style-type: none"> Remove sediment, vegetation, and debris from catch basins, trench drains, curb inlets, and pipes; maintain at least 50% conveyance capacity at all times. Identify obstructions and clear them immediately.
	Clogged conveyance capacity	<ul style="list-style-type: none"> Hand-remove sediment, minimizing damage to native vegetation and using proper erosion control measures. Trim vegetation, large shrubs, or trees that can flood structures or increase bank erosion.
	Erosion	<ul style="list-style-type: none"> Control erosion when native soil is exposed or erosion channels are forming. Maintain rock splash pads or energy dissipaters to prevent erosion. Stabilize soils with plants from the Portland Plant List. Use biodegradable erosion control materials. Remove non-biodegradable erosion control materials within 3 years or when plantings are established. Thoroughly irrigate planted areas until vegetation is well established.
	Bank/Side Slope maintenance	<ul style="list-style-type: none"> Stabilize and plant slopes using appropriate erosion control measures when native soil is exposed or erosion channels form.
	Obstructed or non-functioning check-dams	<ul style="list-style-type: none"> Clear and repair check dams to control and distribute flow. Identify and repair causes for channelization causing erosion.
Within 2 years at least 90% native vegetation coverage within the drainage reserve area must be well-maintained and healthy; vegetation must be healthy and dense enough to provide filtering while protecting underlying soils from erosion.		
	MAINTENANCE INDICATOR	CORRECTIVE ACTION
	Dead or dying vegetation	<ul style="list-style-type: none"> Remove dead vegetation and woody material from drainageways when flow is impeded. Replace vegetation to maintain 90% cover density within one year and control erosion where soils are exposed.
	Nuisance or prohibited plants are discovered within the drainage reserve	<ul style="list-style-type: none"> Manually remove weeds. Do not use fertilizers, herbicides or pesticides. Remove nuisance and prohibited vegetation from the Portland Plant List (such as Himalayan blackberries and English Ivy) on discovery. Remove and replace invasive vegetation when it comprises more than 25% of the total vegetative cover. Mulch as needed outside of the drainage channel.

Maintenance Records: Training and/or written guidance for protecting and maintaining drainage reserves (including this O&M Plan) must be provided to all property owners and tenants. The property owner must keep a log, recording all inspection dates, observations, and maintenance activities. This log must be available to City inspectors on request.

Pesticides and Herbicides: The use of pesticides and herbicides is strongly discouraged due to the potential negative impacts to downstream systems. If pesticides and herbicides are required, use the service of a licensed applicator and a product approved for aquatic use.

Inspections: Drainage reserves which have been modified through a City permit process must be inspected and maintained by the property owner in order to ensure proper function. All facility components, vegetation, and source controls must be inspected for proper operations and structural stability, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event (defined as 1" in 24 hours).

Access: Access to the drainageway must be safe and efficient. Egress and ingress routes must be maintained to design standards. Maintain roadways to accommodate the size and weight of vehicles, if applicable. Obstacles preventing maintenance personnel and/or equipment access to the drainageway must be removed. Gravel or ground cover must be added if erosion occurs, e.g., due to vehicular or pedestrian traffic.

Pollution Prevention: Spill Prevention measures must be exercised when handling substances that contaminate stormwater. Releases of pollutants must be corrected as soon as identified.

STANDARD OPERATIONS AND MAINTENANCE PLAN

3.1.3.3. Culverts

Structural components must be operated and maintained in accordance with the design specifications. Culvert inlets and outlets must maintain an unimpeded and controlled flow of water.

	MAINTENANCE INDICATOR	CORRECTIVE ACTION
	Clogged conveyance capacity	<ul style="list-style-type: none"> • Clear pipes when conveyance capacity is compromised. • Remove accumulated debris and sediment when it blocks 1-foot or 50% of conveyance capacity, whichever is smaller.
	Sediment accumulation	<ul style="list-style-type: none"> • Remove sediment accumulations in pipes using proper erosion control measures.
	Erosion or exposed soils	<ul style="list-style-type: none"> • Control erosion when native soil is exposed or erosion channels are forming. • Use biodegradable erosion control materials. • Remove non-biodegradable erosion control devices within 3 years or when the erosion control plantings are established. • Stabilize soils with plants from the Portland Plants List referenced in Appendix B.
	Cracked or broken pipe/structure	<ul style="list-style-type: none"> • Repair or replace broken or cracked components.
	Scouring at the entrance or exit	<ul style="list-style-type: none"> • Ensure adequate scour protection is provided at the inlet and outlet.
	Bank/side slope stabilization	<ul style="list-style-type: none"> • Stabilize sloped banks with plantings from the Portland Plant List.

Maintenance records: Training and/or written guidance for protecting and maintaining culverts (including this O&M Plan) must be provided to all property owners and tenants. The property owner must keep a log, recording all inspection dates, observations, and maintenance activities. This log must be available to City inspector upon request.

Inspections: Culverts must be inspected and maintained by the property owner to ensure proper function. Inspect facility components for proper operation and structural stability, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event (defined as 1" in 24 hours).

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

Pollution Prevention: Implement spill prevention measures when handling substances that could contaminate stormwater. Releases of pollutants must be corrected as soon as identified.

STANDARD OPERATIONS AND MAINTENANCE PLAN

3.1.3.4. Outfalls

Structural components must be operated and maintained in accordance with the design specifications. Outfall inlet & outlet must maintain an unimpeded and controlled flow of water.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	<ul style="list-style-type: none"> • Clear inlets and outlets including piped outfalls they are plugged. • Address sources of sediment and debris.
Clogged conveyance capacity	<ul style="list-style-type: none"> • Clear overland flow paths and drains when conveyance capacity is diminished by 50%. • Identify causes for altered flow; clear obstructions on discovery.
Sediment accumulation	<ul style="list-style-type: none"> • Remove sediment from pipes using proper erosion control measures.
Erosion or exposed soils	<ul style="list-style-type: none"> • Identify and control sources of erosion when native soil is exposed or erosion channels are forming. • Maintain rock splash pads or energy dissipation structures. • Use biodegradable materials. • Remove non-biodegradable erosion control devices within 3 years or when the erosion control plantings are established. • Stabilize soils with plants from the Portland Plant List.
Cracked or broken pipe/structure	Repair or replace broken or cracked components when necessary.
Check dams missing, scattered or with gaps	Maintain check dams as per standard details.
Scouring at the entrance or exit	Ensure energy dissipation structures such as splash pads, rock rip-rap, gravel, and log check dams are properly installed and replenish materials as necessary.
Bank/side slope stabilization	Stabilize sloped banks with plantings from the Portland Plant List.

Maintenance Records: Training and/or written guidance for protecting and maintaining outfalls (including this O&M Plan) must be provided to all property owners and tenants. The property owner must keep a log, recording all inspection dates, observations, and maintenance activities. This log must be available to City inspector upon request.

Inspections: Outfall must be inspected and maintained by the property owner in order to ensure proper function. All facility components must be inspected for proper operations and structural stability, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event (defined as 1" in 24 hours).

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

Pollution Prevention: Spill Prevention measures must be exercised when handling substances that contaminate stormwater. Releases of pollutants must be corrected as soon as identified.

3.1.4 Private O&M Submittal Requirements

For private stormwater facilities and conveyance features which are implemented or protected under the requirements of the *Stormwater Management Manual*, Operations and maintenance (O&M) is the responsibility of the property owner or designated responsible party. O&M responsibilities and requirements are identified and enforced through an Operations and Maintenance Form and an Operations and Maintenance Plan submitted for BES review and approval prior to permit issuance.

An Operations and Maintenance Plan must meet the requirements of this chapter. For stormwater facilities designed under the Simplified and Presumptive approach, a Standard O&M Plan must be used. For stormwater facilities designed under the Performance Approach, a site-specific plan must be developed. For conveyance features, a Standard O&M Plan may be used to meet the requirements of this chapter or a site-specific plan must be used.

The Bureau of Environmental Services (BES) must review and approve the submittals as part of the development review process (e.g. building or site development permits). Maintaining the stormwater management facilities and conveyance features shown on the site plan is a required condition of the City's approval of the building permit for the identified property.

The applicant must sign the Form and the signature must be notarized. The O&M Form and Plan must be recorded and filed with the county Department of Assessment and Taxation in the county where the property site is located. When completed accurately, the O&M Form meets the recording requirements in Multnomah, Clackamas, and Washington counties.

Failure to properly operate or maintain a stormwater management facility according to the O&M Plan may result in a civil penalty, as specified in Portland City Code [17.38.045: Enforcement](#). This requirement is binding on all current and future owners of the property. Failure to comply with the O&M Plan can trigger an enforcement action, including penalties.

How to complete the Operations and Maintenance Form

The O&M Form must be completed in full as listed below.

Site Legal Description

The Site Legal Description must include all of the tax lots (parcels) with stormwater runoff managed by the onsite stormwater management system. The information must be accurate and correctly filled out on the Form prior to submittal to the County for recording.

To find a property's legal description, visit <https://www.portlandmaps.com/> and browse to the property using the exact address. To locate the Site Legal Description at PortlandMaps.com, select the "Assessor" link on the top menu and locate the boxes labeled "Tax Roll" and "Instrument Number" on the page. If the Tax Roll description has "TL" in it, include the Instrument Number where indicated on Form 2. This information is intended as guidance; it may not be adequate to be accepted for filing by Multnomah County.

Site Plan

The O&M Form includes a small space for a sketched site plan. If the space is not sufficient to include all of the below information, attach a separate site plan. The site plan must include:

- Property boundaries and a north arrow.
- The locations of all of the stormwater facilities and conveyance features in relation to labeled streets, buildings, or other permanent features.
- The locations of utilities including existing-to-remain and proposed water, sanitary, and storm sewers.
- Facility dimensions and setback distances from property lines and structures;
- All stormwater piping associated with the facility including pipe sizes, materials, slopes, and invert elevations.
- Flow arrows illustrating the direction of flow and the order in which stormwater passes through the system if there is a sequence of facilities ("treatment train").
- A cross section for each facility with general dimensions and subsurface elements such as liners, layers of soil and aggregate, and pipes.
- Identify any offsite discharge locations. Include a label indicating the location, ownership, and type of the system to which the discharge drains.

- Additional information may be required on the drawings during permit review, depending on individual site conditions.

If the stormwater system design needs to be modified during the course of a project, and prior to Substantial Completion, please contact BES at 503-823-7761 for guidance on how best to modify and update the O&M Form and/or Plan to reflect the system as built. If the O&M Form and/or Plan requires revision, either because the O&M Form and/or Plan on file with the City is inaccurate or because the owner(s) request and receive City approval to revise it, the owner must record a new O&M Form or Plan with the County. Call the Maintenance Inspection Program at (503) 823-5600 for guidance.

Completed and Recorded O&M Forms and Plans must be filed with BES at the following address:

City of Portland, BES
1900 SW Fourth Ave., Suite 5000
Portland, OR 97201

County Recorder's Office Information

Multnomah County Recorder
501 SE Hawthorne St.
Suite 175
Portland, OR 97214
<https://multco.us/recording/recording-documents>
Phone: 503-988-3326

Clackamas County Recording Division
1710 Red Soils Ct., #110
Oregon City, OR 97045
<http://www.clackamas.us/recording/>
Phone: 503-655-8551

Washington County Recording Division
155 N. First Ave.
Suite 130, MS 9
Hillsboro, OR 97124
<http://www.co.washington.or.us/AssessmentTaxation/Recording/>
Phone: 503-846-8752



CITY OF PORTLAND
Stormwater
Management
Manual

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

This O&M Form supercedes document number _____

(for official county use only)

PROJECT NAME _____

PERMIT INFORMATION

Permit # _____

Permit Submittal Date _____

SITE INFORMATION (include all parcels)

R# (6 Digits) _____

Site Address _____

City / State / Zip _____

Preparation Date: _____

OWNER INFORMATION (ALL LEGAL OWNERS)

Name (1) _____

Name (2) _____

Address (Mailing) _____

City / State / Zip _____

O&M PREPARER INFORMATION

Name _____

Address (Mailing) _____

City / State / Zip _____

Phone (area code required) _____

Email _____

Site Legal Description:

Responsible Party for Maintenance (check one)

Homeowners Association Property Owner

Property Management Company Tenant

Other (describe) _____
(not Contractor or Consultant)

Contact Information for Responsible Party

Contact Name _____

Contact Organization _____

Phone (area code required) _____

Email: _____

Maintenance Practices and Schedule

These operation and maintenance practices are required in accordance with Portland City Code, Chapter 17.38.

The requirements are based on the current version of the *City of Portland Stormwater Management Manual* on the date of permit submittal.

For the **Simplified Approach and Presumptive Approach**, please attach the Standard O&M Plan for each facility type from the *Stormwater Management Manual*, Chapter 3.1.1

For the **Performance Approach**, please attach the approved, site specific O&M Plan per the *Stormwater Management Manual*, Chapter 3.1.2

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

SITE PLAN

Provide a site plan sketch in the area provided below, or attach a scaled site plan to this submittal that includes all of the information required as shown in Chapter 3.1.4, in Operations & Maintenance, Submittal Requirements, Site Plan.

STEP 1 – COMPLETE THE FOLLOWING TABLE

Stormwater Facility Type (Chapter 2)	Stormwater Facility Size (sf)	Drainage is from Roof or Lot?	Impervious Area Treated (sf)	Discharge Point
Totals				

Maintaining the stormwater management facility or facilities listed above shown on the following (or attached) site plan is a required condition of building permit approval for the identified property. Property owners are required to operate and maintain facilities in accordance with the O&M plan on file with the City of Portland. This requirement is binding on all current and future owners of the property. Failure to comply with the O&M plan can trigger an enforcement action, including penalties. The O&M plan may be modified by written consent of current owners and written approval of the Bureau of Environmental Services.

STEP 2 – REQUIRED SITE PLAN

(insert or draw here, or attach separate sheet)

I Have Attached a Site Plan

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

SIGNATURE AND ACKNOWLEDGEMENT

By signing below, the owner accepts and agrees to the terms and conditions contained in this O&M Form and in any document executed by filer and recorded with it. The owner further acknowledges that this documentation has been prepared on their behalf and that they are responsible for the quality and completeness of the O&M Plan. Any failure to comply with the terms of these plans may result in enforcement actions by BES requiring the property owner to restore the stormwater facilities to a functional state as approved under original requirements.

The owner also accepts that the City requires property owners to submit and record, with the County, complete and accurate O&Ms enforceable under City Code 17.38 and that substantial changes to the O&M require City approval prior to County recording. A revised O&M must state that it supersedes a previous O&M (with cited county document number; See Page 1).

THIS PAGE MUST BE SIGNED IN THE PRESENCE OF A NOTARY.

Property Owner or Authorized Representative (1) Signature

Property Owner or Authorized Representative (2) Signature

NOTARY SIGNATURE AND STAMP

INDIVIDUAL Acknowledgement

This acknowledgement is intended for property owned by individuals or trusts.

STATE of OREGON county of: _____

This instrument was acknowledged
before me on: *(date)* _____

By: *(owner 1)* _____

By: *(owner 2)* _____

Notary Signature _____

My Commission Expires _____

Notary Seal:

OR CORPORATE Acknowledgement

This acknowledgement is intended for corporation, government agencies, school districts, or other formal entities

STATE of OREGON county of: _____

This instrument was acknowledged
before me on: *(date)* _____

By: *(representative)* _____

As: *(Title)* _____

Of: *(Corporation)* _____

Notary Signature _____

My Commission Expires _____

Notary Seal:

3.2 Operations and Maintenance Requirements for Future Public Facilities

Stormwater management facilities constructed via a Public Works Permit and intended to receive runoff from the public right-of-way are expected to become public (City-maintained) infrastructure. However, such facilities are required to successfully complete a warranty and establishment period before the O&M is transferred from the Permittee of the Public Works Permit to the City.

For public facilities, the required O&M submittal to BES is a [Public Works O&M Form](#) and an O&M Plan. The [O&M Form](#) identifies the Permittee responsible for maintenance and the O&M Plan establishes the maintenance practices required to establish the vegetative portions of the stormwater facility. For green street facilities, use of the Standard O&M Plan is required (see [Section 3.2.1.1](#)). For all other facility types, a site-specific O&M Plan must be developed and submitted prior to construction as part of the review process. This plan will be in effect during the warranty period when the Permittee is responsible for O&M.

The O&M Plan must include acceptable permanent access accommodations for the City to perform both warranty period inspections and long-term O&M activities.

Maintenance by Environmental Services' Watershed Revegetation Program

Public Works Permit applicants may enter into an agreement with the BES Watershed Revegetation Program (WRP) to provide warranty-period vegetation services for green street facilities. The agreements typically include:

- Irrigation
- Vegetation monitoring and replacement of dead plants
- Sediment removal
- Treatments specific to the agreement for maintenance

Projects where the WRP is contracted to provide vegetation services will be exempt from vegetation inspections, but the Permittee is still responsible during the warranty period for other permit elements such as structural components and inlets. Permittees do not need to submit an O&M Plan but must still complete the [O&M Form](#) and maintain a Public Stormwater Facility Inspection Log.

Contact the WRP at 503-823-2024 for further information.

3.2.1 Establishment and Maintenance Requirements

The Permittee (generally a contractor or developer) that builds stormwater management facilities under a Public Works Permit is responsible for maintaining all site stormwater management features during the two-year warranty maintenance period. This includes maintaining, repairing, and/or replacing the associated vegetative components; any structural or functional repairs; and the general maintenance of the facility as outlined in the O&M Plan.

Facilities must be checked regularly for the maintenance needs identified in the O&M Plan. If the City finds deficiencies in the work during the warranty maintenance period, a deficiency list will be sent to the Permittee who will then have 15 days to complete the work after written notice is received. If corrective work is not completed in the required time frame, the City may perform any work necessary to correct deficiencies, and will seek reimbursement from the Permittee through the bond for all costs associated with bringing the stormwater management facility into compliance with permit requirements.

Portland City Code requires the Permittee to keep a Public Stormwater Facility Inspection Log that notes all inspection dates, the facility components inspected, and any maintenance or repairs made. The logs must document deficiencies and corrective actions taken to keep structural and vegetative components functioning as designed. The City may accept work orders, invoices, or receipts as supporting detail for an inspection and maintenance log. If deficiencies are identified by City staff during the warranty maintenance period, the Public Stormwater Facility Inspection Log and other documentation must be presented to determine the frequency and type of maintenance conducted.

Timeline of two-year warranty maintenance activities

After the stormwater management facilities are constructed and planted per the approved plan, the City will issue a Letter of Completion. This letter provides official notification that construction is complete and that the two-year maintenance warranty period has begun.

Release of two-year warranty

The City will issue a letter to the Permittee identifying any deficiencies that must be corrected prior to the end of the maintenance warranty period.

At the end of the 24-month warranty period, if the stormwater management facility has passed all inspections and deficiencies have been corrected as identified by City staff, the warranty maintenance period will end and the stormwater management facility will be turned over to the City for long-term maintenance

STANDARD O&M PLAN for the Warranty Maintenance Period

3.2.1.1. Green Street Facilities including Curb Extensions, Swales, Planters

REGULAR INSPECTIONS

The Permittee named on the Public Works Permit O&M Form is responsible for inspecting each part of the system at least once every three months for the duration of the maintenance warranty period. Inspections must also be made within 48 hours after all major storm events, defined as greater than 1.0 inch of rain in a 24-hour period.

VEGETATION COVER AND HEALTH

Vegetation must be healthy and vigorous at the time of installation. The goal of the two-year maintenance warranty period is to maintain this vigor and health, while controlling undesirable vegetation.

- A survival rate of 90% is required at all times over the two-year warranty period; plant replacement is required if the rate is less than 90%.
- Individual bare spots may be no larger than 10 square feet.
- Plant replacement must occur during the following planting seasons:
- Planting outside the listed planting seasons requires written approval by the City.
- Replant per the permitted plan, or seek approval for substitutions from the plant list in Section 2.4.1.
- Use of fertilizers is not allowed in storm water management facilities during the maintenance warranty period.
- Remove dead or dying vegetation; standing dead (brown) stems of rushes and sedges can be “combed out” by hand or with a spring rake.
- Trimming or cutting of vegetation is allowed to maintain clearance along sidewalks and curb edges only.

PLANTING SEASONS	
SPRING	FEB 1–MAY 1
FALL	OCT 1–DEC 1

WEED CONTROL

A weed is any vegetation not listed on the permitted planting plan.

- Remove weeds entirely, including all roots and root fragments, by hand, before plants set seed.
- No more than 5% coverage by weeds is allowed in a facility at any given time.
- Use of herbicides is not allowed in stormwater management facilities during the maintenance warranty period.

TREE HEALTH

All trees must be healthy and vigorous, with trunk and limbs free from insects, disease, defects, injuries, and decay, throughout the maintenance warranty period.

- Dead, dying, diseased, injured, or otherwise defective trees must be replaced.
- Tree replacement must occur during the following planting seasons:
- Planting outside the listed planting seasons requires written approval by the City.

PLANTING SEASONS	
SPRING	FEB 1–MAY 1
FALL	OCT 1–DEC 1

INFILTRATION

Each facility is designed to drain within 48 hours after the end of a storm event.

A facility with standing water 48 hours after the end of a storm event must be reported to the BES Construction Manager immediately.

EROSION

Erosion within a stormwater facility can reduce infiltration rates, expose plant roots and structures, and clog outlets.

- Maintain soil elevations and grades per plan.
- Significant erosion must be addressed immediately. Notify the BES Construction Manager for guidance.

MULCH

Mulch may be used to inhibit weed growth, retain moisture, reduce soil erosion and compaction, and add nutrients. Mulch may be allowed on a case-by case basis.

- Apply and maintain mulch per plan, or as directed.
- Ensure that no mulch covers plants or comes into contact with tree trunks or woody stems of plants.
- Keep mulch off structures, roadways, shoulders, walks, and lawns.
- Mulch must be fine to medium 100% natural hemlock bark free of dyes and pesticides.
- Submit detailed vendor and mulch product information for review and approval prior to placement.

LEAF REMOVAL

Excess leaf material in a facility may impede conveyance and infiltration, reduce storage capacity, and increase nutrient loading.

- During regular maintenance visits, and more frequently during the fall season, remove leaf material from the facility, including inlets, outlets, forebays, overflow structures, and curbs.
- Clean the street gutter line to 10 feet upstream of the curb inlets, or the nearest driveway apron, to maintain open inlets between visits.

IRRIGATION

All permitted vegetation requires irrigation during the maintenance warranty period to maintain health and vigor. Even drought tolerant plants need water during warm, dry months, particularly during the first two years while plants are getting established, and during times of unusual heat and drought.

- Irrigation is required once each week (minimum) during the summer irrigation season.
- Irrigation is required once every two weeks (minimum) during the spring and fall irrigation seasons (*see right*):
- Use portable tanks, truck water systems, or temporary above-ground irrigation devices.
- Tree watering bags may be used from May 15th- October 1st, but must be removed every fall.

IRRIGATION MINIMUMS		
SPRING	MAY 15 – JUNE 30	once every two weeks
SUMMER	JULY 1–AUG 31	once every week
FALL	SEPT 1 –OCT 1	once every two weeks

SEDIMENT REMOVAL

Sediment is mineral or organic matter deposited into the facility. Excess sediment in a facility can impede conveyance and infiltration, reduce storage capacity, and bury vegetation.

- Conveyance capacity must be maintained at least 75% (minimum) at all times.
- Sediment must be removed from inlets and forebays during each inspection and after every major storm.
- Remove accumulated sediment from inside the facility during routine maintenance visits.

TRASH AND DEBRIS REMOVAL

Excess trash and debris in a facility may impede conveyance and infiltration.

- Trash and debris must be removed during every site visit.

3.2.2 Manufactured Stormwater Treatment Technologies

Facility-specific operations and maintenance (O&M) plans are required for manufactured stormwater treatment technologies (MSTT). O&M for manufactured technologies is specific to the device and is critical to long-term pollution reduction performance. Design and installation of individual devices is done in partnership with the manufacturer, who provides a letter confirming that the device has been sited, sized, and designed appropriately. The project designer is responsible for confirming that any conditions of use are met.

Each MSTT has a recommended O&M guide or plan provided by the manufacturer that includes minimum inspection frequencies, maintenance triggers, and typical media replacement frequencies. The O&M guide for any proposed public MSTT must be submitted along with the Public Works Stormwater Operations and Maintenance Form. The Public Works Permittee (generally the construction contractor or developer) is responsible for O&M of any MSTT through the end of the warranty period.

Changes to pollutant loading or site conditions, spills, localized erosion, or large storm events may require increasing maintenance frequencies in order to maintain pollution reduction performance. Minimum maintenance practices or frequencies may need to be modified in order to maintain MSTT functionality and to meet warranty requirements.

Even if manufacturers include a maintenance plan or warranty with device purchase, ultimate responsibility for the MSTT O&M lies with the Permittee of the Public Works Permit. It is the Permittee's responsibility to ensure and document that maintenance is performed as per any maintenance agreement or while under warranty.

3.2.3 Submittal Requirements for Future BES Facilities

These submittal requirements are specific to facilities constructed as public improvements, or under a Public Works Permit, that will become public stormwater facilities owned and managed by BES following a 2-year warranty maintenance period. The facilities may include Green Street facilities, regional or neighborhood facilities, and manufactured stormwater treatment technologies. Adequate operations and maintenance is essential during the warranty maintenance period, prior to BES taking responsibility for long-term maintenance.

How to Prepare and Submit a Public Works O&M Submittal

The City of Portland requires the following documents for all stormwater management facilities in the right-of-way:

- A Public Works O&M Form
- An O&M Plan (unless the Watershed Revegetation Program will be maintaining the vegetative components of the facility)
- A Site Plan
- A Planting Plan

BES must review and approve the submittals prior to construction. Maintaining the stormwater management facilities shown on the site plan is a required condition of the City's approval of the project. These submittals are required in all circumstances. The required documents must be submitted in electronic format to the BES construction manager or permit reviewer identified in the Public Works Form.

O&M Form

The Public Works O&M Form must include the Public Works Permit and project information, the name of the Permittee (Public Works Permit applicant, generally the contractor or developer), and a signature acknowledging responsibility for the two-year warranty maintenance period, including structural components and plant establishment, as appropriate.

O&M Plan

The O&M plan must identify all the maintenance requirements needed to properly establish future public facilities. BES's Watershed Revegetation Program staff will inspect facilities to assure compliance with this requirement.

If the Watershed Revegetation Program is maintaining the vegetative components of the facility, no O&M Plan is required.

For stormwater facilities designed under the Presumptive Approach (generally, green streets such as curb extensions, swales, and planters), the Standard O&M Plan for Green Streets must be used (see [Section 3.2.1.1 Green Street Facilities](#)). If the project consists of regional or neighborhood facilities or manufactured stormwater treatment technologies, an O&M Plan must be developed and submitted for review that meets the O&M requirements of Chapter 3.

Site Plan

The site plan must show the locations of the following:

- Existing utilities, including overhead and underground utilities.
- Nearby fixtures including hydrants, benches, and bike racks.

The site plan must be attached to the [O&M Form](#). The permit number and sheet number can be used to reference the location of the information within the Public Works Permit as long as the information on the sheet meets the Site Plan requirements. A single plan can be submitted incorporating the elements of the Site Plan and Planting Plan, but it must include all of the elements listed for both plans.

Planting Plan

The planting plan must:

- Show where the plants are to be placed.
- Provide labels so the contractor can determine where the plants should be positioned and the city inspector can check compliance.
- Include a planting legend with the following information: plant species (both botanical and common names), size at installation, spacing, and quantities.
- List the square footage of the facility.

The planting plan must be attached to the [O&M Form](#). The permit number and sheet number can be used to reference the location of the information as long as it meets the Planting Plan requirements. A single plan can be submitted incorporating the elements of the Site Plan and Planting Plan, but it must include all of the elements listed for both plans.



CITY OF PORTLAND
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PUBLIC WORKS O&M FORM

FOR FUTURE BUREAU OF ENVIRONMENTAL SERVICES (BES) FACILITIES

For green streets facilities, regional or neighborhood facilities, and manufactured stormwater treatment facilities constructed as public works improvements.

PLEASE FILL THIS FORM OUT COMPLETELY.

Detailed information about submittal requirements is contained in Section 3.2.3. For assistance in completing this form, consult with the BES Revegetation Program at 503-823-2024.

A complete O&M submittal consists of this form with a Site Plan, Planting Plan, and O&M Plan (if required).

(for official use only)

Received by: _____

Date: _____

Deemed complete on: _____

PROJECT INFORMATION

BES Job Number: _____

Job Description: _____

Job Location: _____

BES Construction Manager Name and Telephone Number: _____

PUBLIC WORKS PERMIT APPLICANT

(Permittee)

Name: _____

Phone: _____

Email: _____

Mailing Address: _____

City/State/Zip: _____

MAINTENANCE CONTRACTOR

(if different than the Permittee)

Name: _____

Phone: _____

Email: _____

Mailing Address: _____

City/State/Zip: _____

ATTACHMENTS *(ALL must be checked and attached)*

- Site Plan (or reference BES Permit # _____, Sheet # _____)
- Planting Plan (or reference BES Permit # _____, Sheet # _____)
- O&M Plan (For Green Street projects, use the Standard O&M Plan for *Green Street Facilities*)

All structural components, including inlets, drain pipes, check dams, and liners, must freely convey stormwater and be repaired or replaced if damaged over the duration of the warranty period. I accept, agree to, and assume responsibility for compliance to the terms and conditions contained in this form and the O&M Plan.

Signature: *(Permittee)* _____ **Date:** _____

Print Name: _____