

APPENDIX D. INSPECTION AND MAINTENANCE CHECKLISTS

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SUSMP VERIFICATION

The following inspection and maintenance forms can be substituted for the self-verification forms in the San Diego County SUSMP (2012), which are available from:

http://www.sdcountry.ca.gov/dpw/watersheds/susmp/susmppdf/susmp_appendix_f.pdf

These are general maintenance checklists. Please refer to the project-specific Storm Water Management Plan (SWMP) for specific design elements for each IMP. These maintenance checklists can be modified to incorporate specific maintenance requirements based on the project specific IMP design.

Ensure that no illegal discharges occur when maintenance activities are being conducted. For example, collect sediment laden discharge and debris if flushing an underdrain system or cleaning rock infiltration swales, etc. Leaves and debris should not be disposed of in the adjacent catch basin or receiving water.

If mosquitoes are present or larvae observed in standing water please call the County Vector Control at (858) 694-2888. All IMPs should be designed to dewater in 96 hours.

All IMPs identified in the project SWMP should be reported annually to the County of San Diego. For more information please call (858) 495-5318 or e-mail watersheds@sdcounty.ca.gov.

Inspection and Maintenance Checklist

BIORETENTION

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	Water stands in the bioretention area between storms and does not drain within 24 hours after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following could apply: sediment or trash blockages removed, grade from head to foot of bioretention area improved, media surface scarified, underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Trash and debris accumulated in the bioretention area and around the inlet and outlet.			Trash and debris removed from the bioretention area and disposed of properly.
3. Sediment	Evidence of accumulated sediment in the bioretention area.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased or overgrown.			Vegetation is healthy and attractive. Grass is maintained at least 3 inches in height.
6. Mulch	Mulch is missing or patchy. Areas of bare earth are exposed or mulch layer is less than 3 inches deep.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
7. Inlet/outlet	Sediment accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
8. Miscellaneous	Any condition not covered above that needs attention for the bioretention area to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

<h2 style="margin: 0;">Inspection and Maintenance Checklist</h2> <h1 style="margin: 0;">BIORETENTION SWALE</h1>	Permit no. _____
	BMP location _____
	Responsible party _____
	Phone number (____) _____ Email _____
	Responsible party address _____
	Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	Water stands in the bioretention swale between storms and does not drain within 24 hours after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following could apply: sediment or trash blockages removed, grade from head to foot of bioretention area improved, media surface scarified, underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Trash and debris accumulated in the bioretention swale and around the inlet and outlet.			Trash and debris removed from the bioretention swale and disposed of properly.
3. Sediment	Evidence of accumulated sediment in the bioretention swale.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses throughout the bioretention swale. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased, or overgrown.			Vegetation is healthy and attractive. Grass is maintained at least 3 inches in height.
6. Mulch (if used)	Mulch is missing or patchy. Areas of bare earth are exposed or mulch layer is less than 3 inches deep.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
7. Inlet/outlet	Sediment or debris accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
8. Miscellaneous	Any condition not covered above that needs attention for the bioretention swale to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

PERMEABLE PAVEMENT

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	When water stands on the surface of the permeable pavement and 48 hours has passed since the last rainfall.			There should be no areas of ponded/standing water more than 48 hours after a rain event. Any of the following can apply: surface swept or vacuumed, underdrains added, underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Leaves, grass clippings, trash, etc., are preventing water from draining into the permeable pavement and are unsightly.			Area is free of all debris and the permeable pavement is draining properly.
3. Vegetation	Vegetation around the perimeter of the permeable pavement is dead, diseased, or overgrown. Weeds are growing on the surface of the permeable pavement.			Area adjacent to pavement is well-maintained and no bare/exposed areas exist; grass is maintained at a height of 3–6 inches. No weeds present in the pavement area.
4. Deteriorating surface	The pavement is cracked; paver blocks are misaligned or have settled.			The surface area is stabilized, exhibiting no signs of cracks or uneven areas in the pavement area.
5. Miscellaneous	Any condition not covered above that needs attention for the permeable pavement area to function as designed.			The design specifications are met.

- a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

ROCK INFILTRATION TRENCH

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	When water stands in the infiltration trench between storms and does not drain within 24 hours after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following can apply: sediment or trash blockages removed, grade improved, media surface scarified, underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Trash and debris accumulated in the infiltration trench and around the inlet and outlet.			Trash and debris removed and disposed of properly.
3. Sediment	Evidence of accumulated sediment in the infiltration trench.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses throughout the infiltration trench. Obstructions and sediment are disposed of properly.
5. Inlet/outlet	Sediment or debris accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
6. Surface materials	Material is missing or patchy; areas of bare earth are exposed.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
7. Miscellaneous	Any condition not covered above that needs attention for the infiltration trench to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

FLOW THROUGH PLANTER BOX

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	When water stands in the planter box between storms and does not drain within 24 hours after rainfall.			There should be no areas of standing water after inflow has ceased. Any of the following could apply: sediment or trash blockages removed, mulch replaced, soil media surface scarified, underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Trash and debris accumulated in the planter box and around the inlet and outlet.			Trash and debris removed and disposed of properly.
3. Sediment	Evidence of accumulated sediment in the planter box.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased, or overgrown.			Vegetation is healthy and attractive. Grass maintained at least 3 inches in height.
6. Mulch	Mulch is missing or patchy; areas of bare earth are exposed, or mulch layer is less than 3 inches deep.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even at a depth of 3 inches.
7. Inlet/outlet	Sediment or debris accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
8. Affected impervious areas or structures	Obvious effects on surrounding impervious areas or structures.			Hydraulic restriction layers prevent impacts from infiltration to surrounding structures.
9. Miscellaneous	Any condition not covered above that needs attention for the planter box to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

VEGETATED (GREEN) ROOF

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	Roof drainage system is clogged.			There should be no areas of standing water on the green roof. The drainage system is inspected for clogging conditions and repaired or replaced as needed.
2. Erosion	Areas of scoured media or bare roof.			Green roof media stays in place and does not migrate across or erode from roof surface. Eroded media replaced and re-vegetated. If problem is recurrent, consider media more resistant to wind erosion or installing media retention components.
3. Vegetation	Vegetation is dead, missing, incorrect or unwanted.			Areas of missing vegetation replanted. Plant species are appropriate to conditions and drainage system is functioning properly. If problem is recurrent, consider irrigation during establishment or use alternative species. Unwanted vegetation removed and replaced with appropriate species. Evaluate growing conditions for cause of invasive vegetation.
4. Leaking roof	Roof liner has failed.			Evaluate liner for cause of leaks. Repair or replace as necessary.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

SAND FILTER

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	When water stands over the sand filter media between storms and does not drain within 24 hours after rainfall.			There should be no areas of standing water after inflow has ceased. Any of the following could apply: sediment or trash blockages removed, filter media surface scarified, media replaced underdrains flushed in manner that does not cause an illegal discharge.
2. Trash and debris	Trash and debris accumulated in the sand filter and around the inlet and outlet.			Trash and debris removed from filter and disposed of properly.
3. Sediment	Evidence of accumulated sediment in the sand filter.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, or there is other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses throughout the sand filter media. Obstructions and sediment are disposed of properly.
5. Inlet/outlet	Sediment or debris accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
6. Miscellaneous	Any condition not covered above that needs attention for the sand filter to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

CISTERN

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Low flow	Gutters are full of debris and overflowing.			Gutters should be clear and free-flowing when gutters are cleaned and gutter guards or screens are installed.
2. Inlet	Filters are clogged or full.			Filters are clean and free of trash and debris.
3. First flush diverter	First flush filter is full or clogged causing permanent flow to the cistern.			First flush is diverted away from the cistern when the first flush diverter valve is removed and cleaned.
4. Cistern does not drain within 48 hours	Outlet is clogged.			Cistern completely drains in less than 48 hours.
5. Cistern drains in less than 24 hours	Cistern leaks or outlet allows excessive flows.			Cistern drains in 24 to 48 hours.
6. Miscellaneous	Any condition not covered above that needs attention for the cistern to function as designed.			The design specifications are met.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

VEGETATED SWALE

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Standing water	When water stands in the swale between storms and does not drain freely.			There should be no areas of standing water after inflow has ceased. Outlet structures and underdrain (if installed) should drain freely.
2. Trash and debris	Trash and debris that exceeds 5 cubic feet per 1,000 square feet (one standard garbage can).			Trash and debris are removed from the swale.
3. Visual contaminants and pollution	Visual evidence of oil, gasoline, contaminants, or other pollutants.			No visual evidence of contaminants or pollutants present.
4. Sediment	Sediment depth exceeds 2 inches or covers vegetation.			Sediment deposits removed without significant disturbance of the vegetation. Swale is level from side to side and drains freely toward outlet.
5. Erosion	Eroded or scoured areas due to flow channelization or high flows.			No erosion or scouring in swale bottom. For ruts or bare areas less than 12 inches wide, damaged areas repaired by filling with crushed gravel. Over time the grass will start to cover the rock.
6. Vegetation	Grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom.			Vegetation coverage is in more than 90% of the swale bottom. Poorly vegetated areas of the swale bottom are re-planted with plugs of grass from the upper slope and reseeded in locations where plugs were taken. Plugs are planted in the swale bottom with no gaps, or reseeded into loosened, fertile soil.

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
	<p>Grass is excessively tall (greater than 10 inches) or nuisance weeds and other vegetation start to take over.</p> <p>Vegetation growth is poor because sunlight does not reach swale.</p>			<p>Vegetation trimmed or mowed, and nuisance vegetation removed so that flow is not impeded. Vegetation/grass maintained at a height of 4–6 inches (depending on landscape requirements). Grass clippings removed.</p> <p>Overhanging limbs and brushy vegetation on side slopes are trimmed back.</p>
7. Inlet/outlet	Sediment or debris accumulations.			Inlet/outlet is clear of sediment and debris and allows water to flow freely.
8. Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire swale width.			Spreader leveled and cleaned such that flows are distributed evenly over the entire swale width.
9. Low-flow channel overflow	Nuisance flows are ponding, swale is continually wet.			Low-flow channel media is renewed to adequately convey nuisance flows.
10. Constant baseflow	When small quantities of water continually flow through the swale, even when it has been dry for weeks, and an eroded muddy channel has formed in the swale bottom.			A low-flow pea gravel drain can be added to the length of the swale or an underdrain can be installed to prevent an eroded or muddy channel.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).

Inspection and Maintenance Checklist

VEGETATED FILTER STRIP

Permit no. _____
 BMP location _____
 Responsible party _____
 Phone number (____) _____ Email _____
 Responsible party address _____
 Date of inspection _____

Defect	Conditions when maintenance is needed	Maintenance needed?	Date and description of maintenance conducted ^a	Results expected when maintenance is performed
1. Sediment	Sediment depth exceeds 2 inches or covers vegetation.			Sediment deposits removed and surface re-leveled to maintain sheet flow over the filter strip.
2. Erosion	Eroded or scoured areas due to flow channelization or high flows.			No erosion or scouring evident. For ruts or bare areas less than 12 inches wide, damaged areas repaired by filling with crushed gravel. Over time the grass will start to cover the rock.
3. Trash and debris	Trash and debris accumulated on the filter strip.			Trash and debris removed from filter strip and flow spreading devices.
4. Visual contaminants and pollution	Any visual evidence of oil, gasoline contaminants, or other pollutants.			No visual contaminants or pollutants present.
5. Vegetation	When grass becomes excessively tall (greater than 10 inches). Evidence of nuisance weeds and other unwanted vegetation. Vegetation seems crowded or overgrown.			Grass mowed to a height of 2–5 inches and clippings removed. Nuisance vegetation controlled such that flow is not impeded using Integrated Pest Management (IPM) techniques if applicable. For more information, see http://www.ipm.ucdavis.edu . Minor vegetation removal and thinning. Mowing berms and surroundings. Facility looks well kept.
6. Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through the entire filter width.			No visual contaminants or pollutants present.

a. Attach copies of available supporting documents (photographs, copies of maintenance contracts, and/or maintenance records).