APPENDIX G

Stormwater Control Operations and Maintenance Requirements

Note:

Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

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SPU	Director's Rule DWW-200

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Title 22.800 Stormwater Code	Nathan Torgelson, Director, SDCI	
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	Andrew Lee, General Manager/CEO, SPU	

This appendix contains the maintenance requirements for the following typical stormwater BMPs and components:

Refer to the *Stormwater Management Manual for Western Washington* (SWMMWW) (Ecology 2019) for maintenance requirements for the following BMP:

Media filter drain (MFD)

All stormwater facilities, best management practices (BMPs), and drainage systems shall be kept in continuous working order consistent with their design and permitting. All stormwater facilities, BMPs, and drainage systems shall be kept accessible for maintenance and inspection at all times.

Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint shall be immediately corrected. This includes removing the source of the contamination as well as any contaminants that have been collected or deposited into the facility or conveyance system.

Training/written guidance is required for the proper operation and maintenance of many of the BMPs contained in this manual. Provide proper training and copies of the Operations and Maintenance Manuals to property owners, tenants and responsible individuals.

No. 1 – Detention Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can)	Trash and debris cleared from site
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film

No. 1 (continued)- Detention Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Top or Side Slopes of Dam, Berm or Embankment	A	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes	Rodents removed or destroyed and dam or berm repaired
Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Beaver dams	Dam results in change or function of the facility	Facility is returned to design function (coordinate trapping of beavers and removal of dams with appropriate permitting agencies)
Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Tree growth	Tree growth threatens integrity of dams, berms, or slopes; does not allow maintenance access; or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities

No. 1 (continued)- Detention Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion Any erosion observed on a compacted slope	Slopes stabilized using appropriate erosion control measures If erosion is occurring on compacted slope, a licensed engineer should be consulted to resolve source of erosion.
Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation	Top or side slope restored to design dimensions If settlement is significant, a licensed engineer should be consulted to determine the cause of the settlement.
Storage Area	A	Sediment accumulation	Accumulated sediment that exceeds 10 percent of the designed pond depth	Sediment cleaned out to designed pond shape and depth Pond reseeded if necessary to control erosion
Storage Area (continued)	A	Liner damaged (if applicable)	Liner is visible or pond does not hold water as designed	Liner repaired or replaced
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes

No. 1 (continued)- Detention Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Emergency Overflow/Spillway	A	Tree growth	Tree growth impedes flow or threatens stability of spillway	Trees removed
Emergency Overflow/Spillway (continued)	A	Rock missing	Only one layer of rock exists above native soil in area 5 square feet or larger or any exposure of native soil on the spillway	Spillway restored to design standards

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 2 – Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A, W	Trash and debris	Any trash and debris which exceed 1 cubic foot per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size office garbage can)	Trash and debris cleared from site
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, W, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	A	Grass/groundcover	Grass or groundcover exceeds 18 inches in height	Grass or groundcover mowed to a height no greater than 6 inches

No. 2 (continued)- Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment	A	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes	Rodents removed or destroyed and dam or berm repaired
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion Any erosion observed on a compacted slope	Slopes stabilized using appropriate erosion control measures If erosion is occurring on compacted slope, a licensed engineer should be consulted to resolve source of erosion.

No. 2 (continued)- Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Pond, Top or Side Slopes of Dam, Berm or Embankment (continued)	A	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation	Top or side slope restored to design dimensions If settlement is significant, a licensed engineer should be consulted to determine the cause of the settlement.
Infiltration Pond, Tank, Vault, Trench, or Small Basin Storage Area	A	Sediment accumulation	If 2 inches or more sediment is present or a percolation test indicates facility is working at or less than 90 percent of design	Facility infiltrates as designed
Infiltration Pond, Tank, Vault, Trench, or Small Basin Storage Area (continued)	A	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed	Liner repaired or replaced
Infiltration Tank Structure	A	Plugged air vent	Any blockage of the vent	Tank or vault freely vents
Infiltration Tank Structure (continued)	A	Tank bent out of shape	Any part of tank/pipe is bent out of shape more than 10 percent of its design shape	Tank repaired or replaced to design
Infiltration Tank Structure (continued)	A	Gaps between sections, damaged joints or cracks or tears in wall	A gap wider than ½ inch at the joint of any tank sections Any evidence of soil particles entering the tank at a joint or through a wall	No water or soil entering tank through joints or walls

No. 2 (continued)- Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil entering the structure through cracks Qualified inspection personnel determines that the vault is not structurally sound	Vault is sealed and structurally sound
Inlet/Outlet Pipes	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipes (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipes (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure

No. 2 (continued)- Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment	Replace or repair access door so it can opened as designed
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and covers access opening completely
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate	Lifting rings sufficient to lift or remove door or plate
Infiltration Pond, Tank, Vault, Trench, or Small Basin Filter Bags	A	Plugged	Filter bag more than 1/2 full	Replace filter bag or redesign system
Infiltration Pond, Tank, Vault, Trench, or Small Basin Pre-Settling Ponds and Vaults	A, W	Sediment accumulation	6 inches or more of sediment has accumulated	Pre-settling occurs as designed

No. 2 (continued)- Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Pond, Rock Filter	A	Plugged	High water level on upstream side of filter remains for extended period of time or little or no water flows through filter during heavy rain storms	Rock filter replaced; evaluate need for filter and remove if not necessary
Infiltration Pond Emergency Overflow Spillway	A	Rock missing	Only one layer of rock exists above native soil in area 5 square feet or larger, or any exposure of native soil at the top of out flow path of spillway Rip-rap on inside slopes need not be replaced	Spillway restored to design standards
Infiltration Pond Emergency Overflow Spillway (continued)	A	Tree growth	Tree growth impedes flow or threatens stability of spillway	Trees removed
Drain Rock	A, W	Water ponding	If water enters the facility from the surface, inspect to see if water is ponding at the surface during storm events If buried drain rock, observe drawdown through observation/ maintenance port or cleanout	Clear piping through facility when ponding occurs Replace rock material/sand reservoirs as necessary Tilling of subgrade below reservoir may be necessary (for trenches) prior to backfill

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 3 – Detention Pipes and Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Pipe or Vault Storage Area	B, W, E	Trash and debris	Any trash and debris accumulated in vault or pipe (includes floatables and non-floatables)	No trash or debris in vault or pipe
Pipe or Vault Storage Area (continued)	A	Sediment accumulation	Accumulated sediment depth exceeds 10 percent of the diameter of the storage area for ½ length of storage vault or any point depth exceeds 15 percent of diameter	All sediment removed from storage area
Pipe or Vault Structure	A	Plugged air vent	Any blockage of the vent	Pipe or vault freely vents
Pipe or Vault Structure (continued)	A	Pipe bent out of shape	Any part of vault/pipe is bent out of shape more than 10 percent of its design shape	Pipe or vault repaired or replaced to design
Pipe or Vault Structure (continued)	A	Gaps between sections, damaged joints or cracks or tears in wall	A gap wider than ½ inch at the joint of any pipe or vault sections Any evidence of soil particles entering the pipe or vault at a joint or through a wall	No water or soil entering pipe or vault through joints or walls

No. 3 (continued)- Detention Pipes and Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil entering the structure through cracks Qualified inspection personnel determines that the vault is not structurally sound	Vault sealed and structurally sound
Inlet/Outlet Pipes	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipes (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipes (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools

No. 3 (continued)- Detention Pipes and Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Access Maintenance hole must be at grade or readily accessible at all times
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment	Replace or repair access door so it can opened as designed
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and covers access opening completely
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate	Lifting rings sufficient to lift or remove door or plate

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 4 – Flow Control Structure & Control Device

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
The Flow Control Structure and Control Device shall conform with design criteria shown upon the approved plans or the design standards in place at the time of construction. This includes but is not limited to, orifice diameter(s), orifice elevation(s) overflow elevation. Reference Standard Plans No. 270, 271, and 272.				
Structure	A	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the structure opening or is blocking capacity of the structure by more than 10 percent	No trash or debris blocking or potentially blocking entrance to structure
Structure (continued)	A	Trash and debris (continued)	Trash or debris in the structure that exceeds 1/3 the depth from the bottom of basin to invert the lowest pipe into or out of the basin.	No trash or debris in the structure
Structure (continued)	A	Trash and debris (continued)	Deposits of garbage exceeding 1 cubic foot in volume	No condition present which would attract or support the breeding of insects or rodents
Structure (continued)	A	Sediment	Sediment exceeds 60 percent of the depth from the bottom of the structure to the invert of the lowest pipe into or out of the structure or the bottom of the control device section or is within 6 inches of the invert of the lowest pipe into or out of the structure or the bottom of the control device section	Sump of structure contains no sediment

No. 4 (continued)– Flow Control Structure & Control Device

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure (continued)	A	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable)	Frame is even with curb
Structure (continued)	A	Damage to frame and/or top slab (continued)	Top slab has holes larger than 2 square inches or cracks wider than ¼ inch	Top slab is free of holes and cracks
Structure (continued)	A	Damage to frame and/or top slab (continued)	Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab	Frame is sitting flush on top slab
Structure (continued)	A	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet Any evidence of soil particles entering structure through cracks Maintenance person judges that structure is unsound	Structure is sealed and structurally sound.
Structure (continued)	A	Cracks in walls or bottom (continued)	Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe Any evidence of soil particles entering structure through cracks	No cracks more than ¼-inch wide at the joint of inlet/outlet pipe
Structure (continued)	A	Settlement/ misalignment	Structure has settled more than 1 inch or has rotated more than 2 inches out of alignment	Basin replaced or repaired to design standards

No. 4 (continued)– Flow Control Structure & Control Device

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure (continued)	A	Damaged pipe joints	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering the structure at the joint of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes
Structure (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Structure (continued)	A	Ladder rungs missing or unsafe	Ladder is unsafe due to missing rungs, misalignment, rust, cracks, or sharp edges	Ladder meets design standards and allows maintenance person safe access.
Control Device	A	Damaged or missing	Riser section is not securely attached to structure wall and outlet pipe structure should support at least 1,000 lbs of up or down pressure	T section securely attached to wall and outlet pipe
Control Device (continued)	A	Damaged or missing	Structure is not in upright position (allow up to 10 percent from plumb)	Structure in correct position
Control Device (continued)	A	Damaged or missing	Connections to outlet pipe are not watertight or show signs of deteriorated grout	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed
Control Device (continued)	A	Damaged or missing	Any holes—other than designed holes—in the structure	Structure has no holes other than designed holes

No. 4 (continued)– Flow Control Structure & Control Device

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Shear Gate (if applicable)	A	Damaged or missing	Cleanout gate is missing	Replace cleanout gate
Shear Gate (if applicable) (continued)	A	Damaged or missing	Cleanout gate is not watertight	Gate is watertight and works as designed.
Shear Gate (if applicable) (continued)	A	Damaged or missing	Gate cannot be moved up and down by one maintenance person	Gate moves up and down easily and is watertight.
Shear Gate (if applicable) (continued)	A	Damaged or missing	Chain/rod leading to gate is missing or damaged.	Chain is in place and works as designed.
Orifice Plate	A	Damaged or missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
Orifice Plate (continued)	A	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate	Plate is free of all obstructions and works as designed
Overflow Pipe	A	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe	Pipe is free of all obstructions and works as designed
Overflow Pipe (continued)	A	Deformed or damaged lip	Lip of overflow pipe is bent or deformed	Overflow pipe does not allow overflow at an elevation lower than design
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables).	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

No. 4 (continued)– Flow Control Structure & Control Device

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Metal Grates (If Applicable)	A	Unsafe grate opening	Grate with opening wider than 7/8 inch	Grate opening meets design standards
Metal Grates (If Applicable) (continued)	B, W, E	Trash and debris	Trash and debris that is blocking more than 20 percent of grate surface	Grate free of trash and debris. footnote to guidelines for disposal
Metal Grates (If Applicable) (continued)	A	Damaged or missing	Grate missing or broken member(s) of the grate	Grate is in place and meets design standards
Maintenance Hole Cover/Lid	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open structure requires urgent maintenance**	Cover/lid protects opening to structure
Maintenance Hole Cover/Lid (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Maintenance hole cover/lid must be at grade or readily accessible at all times
Maintenance Hole Cover/Lid (continued)	A	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Maintenance Hole Cover/Lid (continued)	A	Cover/lid difficult to Remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift	Cover/lid can be removed and reinstalled by one maintenance person

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 5 – Catch Basins and Maintenance Holes

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure	A	Sediment	Sediment exceeds 60 percent of the depth from the bottom of the catch basin to the invert of the lowest pipe into or out of the catch basin or is within 6 inches of the invert of the lowest pipe into or out of the catch basin	Sump of catch basin contains no sediment
Structure (continued)	B, W, E	Trash and debris	Trash or debris of more than ½ cubic foot which is located immediately in front of the catch basin opening or is blocking capacity of the catch basin by more than 10 percent	No trash or debris blocking or potentially blocking entrance to catch basin
Structure (continued)	A	Trash and debris (continued)	Trash or debris in the catch basin that exceeds 1/3 the depth from the bottom of basin to invert the lowest pipe into or out of the basin	No trash or debris in the catch basin
Structure (continued)	A	Trash and debris (continued)	Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane)	No dead animals or vegetation present within catch basin
Structure (continued)	A	Trash and debris (continued)	Deposits of garbage exceeding 1 cubic foot in volume	No condition present which would attract or support the breeding of insects or rodents

No. 5 (continued)– Catch Basins and Maintenance Holes

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure (continued)	A	Damage to frame and/or top slab	Corner of frame extends more than ¾ inch past curb face into the street (If applicable).	Frame is even with curb
Structure (continued)	A	Damage to frame and/or top slab (continued)	Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
Structure (continued)	A	Damage to frame and/or top slab (continued)	Frame not sitting flush on top slab, i.e., separation of more than ¾ inch of the frame from the top slab	Frame is sitting flush on top slab.
Structure (continued)	A	Cracks in walls or bottom	Cracks wider than ½ inch and longer than 3 feet Any evidence of soil particles entering catch basin through cracks Maintenance person judges that catch basin is unsound	Catch basin is sealed and structurally sound
Structure (continued)	A	Cracks in walls or bottom (continued)	Cracks wider than ½ inch and longer than 1 foot at the joint of any inlet/outlet pipe Any evidence of soil particles entering catch basin through cracks	No cracks more than ¼-inch wide at the joint of inlet/outlet pipe
Structure (continued)	A	Settlement/ misalignment	Catch basin has settled more than 1 inch or has rotated more than 2 inches out of alignment	Basin replaced or repaired to design standards

No. 5 (continued)– Catch Basins and Maintenance Holes

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure (continued)	A	Damaged pipe joints	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering the catch basin at the joint of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of inlet/outlet pipes
Structure (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Catch Basin Outlet Trap (Reference Standard Plan No. 267)	A	Missing	When the required outlet trap is not installed upon the outlet pipe	Outlet trap installed and prevents floatables from being discharged
Catch Basin Outlet Trap (Reference Standard Plan No. 267) (continued)	A	Permanently installed	When the trap is grouted to the outlet pipe and is not removable to allow for maintenance and inspection	Outlet trap removable for maintenance and inspection

No. 5 (continued)– Catch Basins and Maintenance Holes

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Catch Basin Outlet Trap (Reference Standard Plan No. 267) (continued)	A	Damaged	Cracks, broken welds, seams or any other conditions that allows water to be discharged from other than the submerged portion of the trap	Water will be discharged from the submerged portion of the trap.
Metal Grates (Catch Basins)	A	Unsafe grate opening	Grate with opening wider than 7/8 inch	Grate opening meets design standards
Metal Grates (Catch Basins) (continued)	B, W, E	Trash and debris	Trash and debris that is blocking more than 20 percent of grate surface	Grate free of trash and debris. footnote to guidelines for disposal
Metal Grates (Catch Basins) (continued)	A	Damaged or missing	Grate missing or broken member(s) of the grate **Any open structure requires urgent maintenance**	Grate is in place and meets design standards
Maintenance Hole Cover/Lid	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open structure requires urgent maintenance**	Cover/lid protects opening to structure
Maintenance Hole Cover/Lid (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Maintenance hole cover/lid must be at grade or readily accessible at all times
Maintenance Hole Cover/Lid (continued)	A	Locking mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools

No. 5 (continued)– Catch Basins and Maintenance Holes

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Maintenance Hole Cover/Lid (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs. of lift	Cover/lid can be removed and reinstalled by one maintenance person

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No. 7 – Debris Barriers (e.g., Trash Racks)

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	B, W, E	Trash and debris	Trash or debris plugging more than 20 percent of the area of the barrier	Barrier clear to receive capacity flow
Facility – General Requirements (continued)	A	Sediment accumulation	Sediment accumulation of greater than 20 percent of the area of the barrier	Barrier clear to receive capacity flow
Structure	A	Cracked, broken, or loose	Structure which bars attach to is damaged Pipe is loose or cracked Concrete structure is cracked, broken, or loose	Sound structure barrier
Bars	A	Bar spacing	Bar spacing exceeds 6 inches	Bars have at most 6-inch spacing
Bars (continued)	A	Damaged or missing bars	Bars bent out of shape more than 3 inches	Bars in place with no bends more than ¾ inch
Bars (continued)	A	Damaged or missing bars (continued)	Bars missing or entire barrier missing	Bars in place according to design
Bars (continued)	A	Damaged or missing bars (continued)	Bars loose and rust is causing 50 percent deterioration to any part of barrier	Repair or replace barrier to design standards

[1] Inspection frequency:

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No. 8 – Energy Dissipaters

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	B, W, E	Trash and debris	Trash and/or debris accumulation	Dissipater clear of trash and/or debris
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Rock Pad	A	Missing or moved rock	One layer or less of rock exists above native soil area 5 square feet or more Any exposed native soil	Rock pad prevents erosion
Dispersion Trench	A	Pipe plugged with sediment	Accumulated sediment that exceeds 20 percent of the design depth	Pipe cleaned/flushed so that it matches design
Dispersion Trench (continued)	A	Not discharging water properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a “sheet flow” of water along trench)	Water discharges from feature by sheet flow
Dispersion Trench (continued)	A	Perforations plugged	Over 1/4 of perforations in pipe are plugged with debris or sediment	Perforations freely discharge flow
Dispersion Trench (continued)	A	Water flows out top of “distributor” catch basin	Water flows out of distributor catch basin during any storm less than the design storm	No flow discharges from distributor catch basin
Dispersion Trench (continued)	A	Receiving area over-saturated	Water in receiving area is causing or has potential of causing landslide problems	No danger of landslides

No. 8 (continued)– Energy Dissipaters

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Gabions	A	Damaged mesh	Mesh of gabion broken, twisted or deformed so structure is weakened or rock may fall out	Mesh is intact with no rock missing
Gabions (continued)	A	Corrosion	Gabion mesh shows corrosion through more than ¼ of its gage	All gabion mesh capable of containing rock and retaining designed form
Gabions (continued)	A	Collapsed or deformed baskets	Gabion basket shape deformed due to any cause	All gabion baskets intact, structure stands as designed
Gabions (continued)	A	Missing rock	Any rock missing that could cause gabion to loose structural integrity	No rock missing
Maintenance Hole/Chamber	A	Worn or damaged post, baffles, or side of chamber	Structure dissipating flow deteriorates to ½ or original size or any concentrated worn spot exceeding 1 square foot, which would make structure unsound	Structure in no danger of failing
Maintenance Hole/Chamber (continued)	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil entering the structure through cracks Maintenance inspection personnel determines that the structure is not structurally sound	Maintenance hole/chamber sealed and structurally sound
Maintenance Hole/Chamber (continued)	A	Damaged pipe joints	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering the structure at the joint of the inlet/outlet pipes	No soil or water enters No water discharges at the joint of inlet/outlet pipes

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No. 9 – Basic and Compost-Amended Biofiltration Swales

No. 9 – Basic and Compost-Amended Biofiltration Swales

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	M	Trash and debris	Trash and/or debris accumulation	No trash or debris at the site
Facility – General Requirements (continued)	B, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Swale Section (continued)	B, E	Sediment accumulation	Sediment depth exceeds 2 inches in 10 percent of the swale treatment area	No sediment deposits in treatment area of the biofiltration swale
Swale Section (continued)	B, E	Sediment accumulation (continued)	Sediment inhibits grass growth over 10 percent of swale length	Grass growth not inhibited by sediment
Swale Section (continued)	B, E	Sediment accumulation (continued)	Sediment inhibits even spreading of flow	Flows are spread evenly over entire swale width
Swale Section (continued)	B, E	Erosion/scouring	Eroded or scoured swale bottom due to channelization or high flows	No eroded or scoured areas in biofiltration swale Cause of erosion or scour addressed
Swale Section (continued)	M	Poor vegetation coverage	Grass is sparse or bare or eroded patches occur in more than 10 percent of the swale bottom	Swale has no bare spots Grass is thick and healthy

No. 9 (continued)– Basic and Compost-Amended Biofiltration Swales

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Swale Section (continued)	B	Grass too tall	Grass is excessively tall (greater than 10 inches) and impeding swale performance Grass is thin Nuisance weeds and other vegetation has taken over	Grass between 3 and 4 inches tall, thick and healthy No clippings left in swale No nuisance vegetation present
Swale Section (continued)	B	Excessive shade	Grass growth is poor because sunlight does not reach swale	Healthy grass growth or Swale converted to a wet biofiltration swale
Swale Section (continued)	B	Constant baseflow	Continuous flow through the swale, even when it has been dry for weeks or an eroded Muddy channel has formed in the swale bottom	Baseflow removed from swale by a low-flow pea-gravel drain or bypassed around the swale
Swale Section (continued)	B	Standing water	Water pools in the swale between storms or does not drain freely	Swale drains freely and no standing water in swale between storms
Swale Section (continued)	B	Channelization	Flow concentrates and erodes channel through swale	No flow channels in swale
Flow Spreader	B	Concentrated flow	Flow from spreader not uniformly distributed across entire swale width	Flows are spread evenly over entire swale width
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes

No. 9 (continued)– Basic and Compost-Amended Biofiltration Swales

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

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No. 10 – Wet and Continuous Inflow Biofiltration Swales

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	M	Trash and debris	Any trash and/or debris accumulated at the site	No trash or debris at the site
Facility – General Requirements (continued)	B, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Swale Section	B, E	Sediment accumulation	Sediment depth exceeds 2 inches in 10 percent of the swale treatment area	No sediment deposits in treatment area
Swale Section (continued)	B, E	Erosion/scouring	Eroded or scoured swale bottom due to channelization or high flows	No eroded or scoured areas in biofiltration swale Cause of erosion or scour addressed

No. 10 (continued)– Wet and Continuous Inflow Biofiltration Swales

Swale Section (continued)	B	Water depth	Water not retained to a depth of about 4 inches during the wet season	Water depth of 4 inches throughout swale for most of wet season
Swale Section (continued)	B	Vegetation ineffective	Vegetation sparse; does not provide adequate filtration Vegetation crowded out by very dense clumps of cattail or nuisance vegetation	Wetland vegetation fully covers bottom of swale No cattails or nuisance vegetation present
Swale Section (continued)	B	Insufficient water	Wetland vegetation dies due to lack of water	Wetland vegetation remains healthy (may require converting to grass-lined biofiltration swale)
Flow Spreader	B	Concentrated flow	Flow from spreader not uniformly distributed across entire swale width	Flows are spread evenly over entire swale width
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

[1] Inspection frequency:

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No. 11 – Filter Strips (Basic and CAVFS)

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	M	Trash and debris	Any trash and/or debris accumulated at the site	No trash or debris at the site
Facility – General Requirements (continued)	B, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Grass Strip	B, E	Sediment accumulation	Sediment accumulation exceeds 2 inches depth	No sediment deposits in treatment area
Grass Strip (continued)	B, E	Erosion/scouring	Eroded or scoured areas due to channelization or high flows	No eroded or scoured areas Cause of erosion or scour addressed
Grass Strip (continued)	B	Vegetation ineffective	Grass has died out Grass has become excessively tall (greater than 10 inches) Nuisance vegetation is taking over	Grass is healthy; between 3 and 4 inches tall No nuisance vegetation present
Flow Spreader	B	Concentrated flow	Flow from spreader not uniformly distributed across entire filter width	Flows are spread evenly over entire filter width
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes

No. 11 (continued)– Filter Strips (Basic and CAVFS)

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 12 – Wet Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A	Trash and debris	Any trash and/or debris accumulated at the site	No trash or debris at the site
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	2X: June – October	Grass/groundcover	Grass or groundcover exceeds 18 inches in height	Grass or groundcover mowed to a height no greater than 6 inches
Side Slopes of Dam, Berm, Internal Berm or Embankment	A	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm Any evidence of water piping through dam or berm via rodent holes	Rodents removed or destroyed Dam or berm repaired

No. 12 (continued)- Wet Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Side Slopes of Dam, Berm, Internal Berm or Embankment (continued)	A	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm or embankment integrity, are not interfering with access or maintenance, or leaves do not cause a plugging problem they do not need to be removed.	Trees do not hinder facility performance or maintenance activities
Side Slopes of Dam, Berm, Internal Berm or Embankment (continued)	A	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion Any erosion observed on a compacted slope	Slopes stabilized using appropriate erosion control measures If erosion is occurring on compacted slope, a licensed engineer should be consulted to resolve source of erosion.
Top or Side Slopes of Dam, Berm, Internal Berm or Embankment	A	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation	Top or side slope restored to design dimensions If settlement is significant, a licensed engineer should be consulted to determine the cause of the settlement.
Top or Side Slopes of Dam, Berm, Internal Berm or Embankment (continued)	A	Irregular surface on internal berm	Top of berm not uniform and level	Top of berm graded to design elevation.

No. 12 (continued)- Wet Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Pond Areas	A	Sediment accumulation (except first wet pool cell)	Accumulated sediment that exceeds 10 percent of the designed pond depth	Sediment cleaned out to designed pond shape and depth.
Pond Areas (continued)	A	Sediment accumulation (first wet pool cell)	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches	Sediment storage contains no sediment
Pond Areas (continued)	A	Liner damaged (if applicable)	Liner is visible Pond does not hold water as designed	Liner repaired or replaced.
Pond Areas (continued)	A, W	Water level (first wet pool cell)	First cell empty; does not hold water	Water retained in first cell for most of the year
Pond Areas (continued)	M (March – October)	Algae mats (first wet pool cell)	Algae mats develop over more than 10 percent of the water surface	Algae mats removed (usually in the late summer before fall rains)
Gravity Drain	A	Inoperable valve	Valve will not open and close	Valve opens and closes normally
	A	Valve will not seal	Valve does not seal completely	Valve completely seals closed
Emergency Overflow Spillway	A	Tree growth	Tree growth impedes flow or threatens stability of spillway	Trees removed
Emergency Overflow Spillway (continued)	A	Rock missing	Only one layer of rock exists above native soil in area 5 square feet or larger Any exposure of native soil at the top of out flow path of spillway (Rip-rap on inside slopes need not be replaced.)	Spillway restored to design standards

No. 12 (continued)- Wet Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

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No. 13 – Wet Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A	Trash and debris	Trash and debris accumulation	Trash and debris removed from facility
Treatment Area	A	Trash and debris	Any trash and debris accumulated in vault (includes floatables and non-floatables)	No trash or debris in vault
Treatment Area (continued)	A	Sediment accumulation	Sediment accumulation in vault bottom exceeds the depth of the sediment zone plus 6 inches	No sediment in vault
Treatment Area (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil entering the structure through cracks Vault does not retain water Qualified inspection personnel determines that the vault is not structurally sound	Vault sealed and structurally sound

No. 13 (continued)- Wet Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vault Structure (continued)	A	Baffles damaged	Baffles corroding, cracking, warping, and/or showing signs of failure Baffle cannot be removed	Repair or replace baffles or walls to specifications
Vault Structure (continued)	A	Ventilation	Ventilation area blocked or plugged	No reduction of ventilation area exists
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Gravity Drain	A	Inoperable valve	Valve will not open and close	Valve opens and closes normally
Gravity Drain (continued)	A	Valve will not seal	Valve does not seal completely	Valve completely seals closed
Access Maintenance Hole	A	Access cover/lid damaged or difficult to open	Access cover/lid cannot be easily opened by one person Corrosion/deformation of cover/lid	Access cover/lid can be opened by one person
Access Maintenance Hole (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Access Maintenance hole must be at grade or readily accessible at all times

No. 13 (continued)- Wet Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Access doors/plate has gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and covers access opening completely
Access Maintenance Hole (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate	Lifting rings sufficient to lift or remove door or plate
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access

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No. 14 – Stormwater Treatment Wetlands

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A	Trash and debris	Trash and debris accumulation	Trash and debris removed from facility
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	2X: June – October	Grass/groundcover	Grass or groundcover exceeds 18 inches in height	Grass or groundcover mowed to a height no greater than 6 inches
Side Slopes of Dam, Berm, Internal Berm, or Embankment	A	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm Any evidence of water piping through dam or berm via rodent holes	Rodents removed or destroyed Dam or berm repaired

No. 14 (continued)- Stormwater Treatment Wetlands

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Side Slopes of Dam, Berm, Internal Berm, or Embankment (continued)	A	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities
Side Slopes of Dam, Berm, Internal Berm, or Embankment (continued)	A	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion Any erosion observed on a compacted slope	Slopes stabilized using appropriate erosion control measures If erosion is occurring on compacted slope, a licensed engineer should be consulted to resolve source of erosion.
Top or Side Slopes of Dam, Berm, Internal Berm, or Embankment	A	Settlement	Any part of a dam, berm or embankment that has settled 4 inches lower than the design elevation	Top or side slope restored to design dimensions If settlement is significant, a licensed engineer should be consulted to determine the cause of the settlement.
Top or Side Slopes of Dam, Berm, Internal Berm, or Embankment (continued)	A	Irregular surface on internal berm	Top of berm not uniform and level	Top of berm graded flat to design elevation

No. 14 (continued)– Stormwater Treatment Wetlands

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Pond Areas	B	Sediment accumulation (first cell/forebay)	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches	Sediment storage contains no sediment
Pond Areas (continued)	B	Sediment accumulation (wetland cell)	Accumulated sediment that exceeds 10 percent of the designed pond depth	Sediment cleaned out to designed pond shape and depth
Pond Areas (continued)	A	Liner damaged (If Applicable)	Liner is visible or pond does not hold water as designed	Liner repaired or replaced
Pond Areas (continued)	A, W	Water level (first cell/forebay)	Cell does not hold 3 feet of water year round	3 feet of water retained year round
Pond Areas (continued)	A, W	Water level (wetland cell)	Cell does not retain water for at least 10 months of the year or wetland plants are not surviving.	Water retained at least 10 months of the year or wetland plants are surviving.
Pond Areas (continued)	M (March – October)	Algae mats (first cell/forebay)	Algae mats develop over more than 10 percent of the water	Algae mats removed (usually in the late summer before fall rains)
Pond Areas (continued)	B	Vegetation	Vegetation dead, dying, or overgrown (cattails) or not meeting original planting specifications	Plants in wetland cell surviving and not interfering with wetland function
Gravity Drain	A	Inoperable valve	Valve will not open and close	Valve opens and closes normally
Gravity Drain (continued)	A	Valve will not seal	Valve does not seal completely	Valve completely seals closed
Emergency Overflow Spillway	A	Tree growth	Tree growth impedes flow or threatens stability of spillway	Trees removed

No. 14 (continued)– Stormwater Treatment Wetlands

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Emergency Overflow Spillway (continued)	A	Rock missing	Only one layer of rock exists above native soil in area 5 square feet or larger Any exposure of native soil at the top of out flow path of spillway (Rip-rap on inside slopes need not be replaced.)	Spillway restored to design standards
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 15 – Sand Filter Basins

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A, E	Trash and debris	Trash and debris accumulation	Trash and debris removed from facility
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	A	Grass/groundcover (not in the treatment area)	Grass or groundcover exceeds 18 inches in height	Grass or groundcover mowed to a height no greater than 6 inches
Pre-Treatment (if applicable)	A	Sediment accumulation	Sediment accumulations in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches	Sediment storage contains no sediment
Pre-Treatment (if applicable) (continued)	A	Liner damaged (If Applicable)	Liner is visible Pond does not hold water as designed	Liner repaired or replaced
Pre-Treatment (if applicable) (continued)	A, W	Water level	Cell empty; does not hold water.	Water retained in first cell for most of the year

No. 15 (continued)- Sand Filter Basins

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Pre-Treatment (if applicable) (continued)	M (March – October)	Algae mats	Algae mats develop over more than 10 percent of the water surface	Algae mats removed
Pond Area	B	Sediment accumulation	Sediment or crust depth exceeds ½ inch over 10 percent of surface area of sand filter	No sediment or crust deposit on sand filter that would impede permeability of the filter section
Pond Area (continued)	2X: June – October	Grass (if applicable)	Grass becomes excessively tall (greater than 6 inches) Nuisance weeds and other vegetation start to take over Thatch build up occurs	Mow vegetation and/or remove nuisance vegetation
Side Slopes of Pond	A	Rodent holes	Any evidence of rodent holes if facility is acting as a dam or berm Any evidence of water piping through dam or berm via rodent holes	Rodents removed or destroyed Dam or berm repaired
Side Slopes of Pond (continued)	A	Tree growth	Tree growth threatens integrity of dams, berms or slopes, does not allow maintenance access, or interferes with maintenance activity. If trees are not a threat to dam, berm, or embankment integrity or not interfering with access or maintenance, they do not need to be removed.	Trees do not hinder facility performance or maintenance activities

No. 15 (continued)– Sand Filter Basins

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Side Slopes of Pond (continued)	A	Erosion	Eroded damage over 2 inches deep where cause of damage is still present Where there is potential for continued erosion Any erosion observed on a compacted slope	Slopes stabilized using appropriate erosion control measures If erosion is occurring on compacted slope, a licensed engineer should be consulted to resolve source of erosion.
Sand Filter Media	A, E	Plugging	Drawdown of water through the sand filter media, takes longer than 24 hours Flow through the overflow pipes occurs frequently	Sand filter media surface is aerated Drawdown rate is normal
Sand Filter Media (continued)	A	Prolonged flows	Sand is saturated for prolonged periods of time (several weeks) and does not dry out between storms due to continuous base flow or prolonged flows from detention facilities	Excess flows bypassed or confined to small portion of filter media surface
Sand Filter Media (continued)	A	Short circuiting	Flows become concentrated over one section of the sand filter rather than dispersed Drawdown rate of pool exceeds 12 inches per hour	Flow and percolation of water through the sand filter is uniform and dispersed across the entire filter area Drawdown rate is normal
Sand Filter Media (continued)	A	Media thickness	Sand thickness is less than 6 inches	Rebuild sand thickness to a minimum of 6 inches and preferably to 18 inches

No. 15 (continued)– Sand Filter Basins

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Underdrains and Clean-Outs	A	Sediment/debris	Underdrains or clean-outs partially plugged or filled with sediment and/or debris Junction box/cleanout wyes not watertight	Underdrains and clean-outs free of sediment and debris and are watertight
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Rock Pad	A	Missing or out of place	Only one layer of rock exists above native soil in area 5 square feet or larger Any exposure of native soil	Rock pad restored to design standards
Flow Spreader	A	Concentrated flow	Flow from spreader not uniformly distributed across sand filter	Flows spread evenly over sand filter

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 16 – Sand Filter Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A, E	Trash and debris	Trash and debris accumulation	Trash and debris removed from facility
Facility – General Requirements (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	A	Grass/groundcover	Grass or groundcover exceeds 18 inches in height	Grass or groundcover mowed to a height no greater than 6 inches
Pre-Treatment Chamber	A	Sediment accumulation	Sediment accumulation exceeds the depth of the sediment zone plus 6 inches	Sediment storage contains no sediment
Sand Filter Media	A	Sediment accumulation	Sediment depth exceeds ½ inch on sand filter media	Sand filter freely drains at normal rate
Sand Filter Media (continued)	A	Trash and debris	Trash and debris accumulated in vault (floatables and non-floatables)	No trash or debris in vault

No. 16 (continued)– Sand Filter Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Sand Filter Media (continued)	A, E	Plugging	Drawdown of water through the sand filter media, takes longer than 24 hours Flow through the overflow pipes occurs frequently	Sand filter media drawdown rate is normal
Sand Filter Media (continued)	A	Short circuiting	Seepage or flow occurs along the vault walls and corners Sand eroding near inflow area Cleanout wyes are not watertight	Sand filter media section re-laid and compacted along perimeter of vault to form a semi-seal Erosion protection added to dissipate force of incoming flow and curtail erosion
Vault Structure	A	Damaged to walls, frame, bottom and/or top slab.	Cracks wider than ½ inch Any evidence of soil entering the structure through cracks Qualified inspection personnel determines that the vault is not structurally sound	Vault replaced or repaired to provide complete sealing of the structure
Vault Structure (continued)	A	Ventilation	Ventilation area blocked or plugged	No reduction of ventilation area exists
Underdrains and Cleanouts	A	Sediment/debris	Underdrains or clean-outs partially plugged, filled with sediment and/or debris or not watertight	Underdrains and clean-outs free of sediment and debris and sealed
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment

No. 16 (continued)– Sand Filter Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment	Replace or repair access door so it can opened as designed

No. 16 (continued)– Sand Filter Vaults

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and covers access opening completely
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate	Lifting rings sufficient to lift or remove door or plate

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

*In addition to the specific maintenance criteria provided below, all manufacturers' requirements shall be followed.

No. 17 – Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A, E	Trash and debris	Any trash or debris or organic material which impairs the function of the facility	Trash and debris removed from facility Flow receives treatment instead of bypassing
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	A	Life cycle	Once per year	Facility is re-inspected and any needed maintenance performed
Vault Treatment Area	Varies – Refer to Manufacturer's requirements.	Sediment on vault floor	Varies – Refer to Manufacturer's requirements.	Vault is free of sediment
Vault Treatment Area (continued)	Varies – Refer to Manufacturer's requirements.	Sediment on top of cartridges	Varies – Refer to Manufacturer's requirements.	Vault is free of sediment
Vault Treatment Area (continued)	Varies – Refer to Manufacturer's requirements.	Multiple scum lines above top of cartridges	Thick or multiple scum lines above top of cartridges	Cause of plugging corrected and canisters replaced if necessary

No. 17 (continued)– Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil particles entering the structure through the cracks Qualified inspection personnel determines the vault is not structurally sound	Vault replaced or repaired to design specifications
Vault Structure (continued)	A	Baffles damaged	Baffles corroding, cracking warping, and/or showing signs of failure	Repair or replace baffles to specification
Filter Media	A, E	Standing water in vault	Varies – Refer to Manufacturer's requirements.	No standing water in vault 24 hours after a rain event
Filter Media (continued)	A	Short circuiting	Flows do not properly enter filter cartridges	Flows go through filter media
Underdrains and Clean-Outs	A	Sediment/debris	Underdrains or clean-outs partially plugged or filled with sediment and/or debris	Underdrains and clean-outs free of sediment and debris
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks wider than ½ inch at the joint of the inlet/outlet pipes Any evidence of soil entering at the joints of the inlet/outlet pipes	Cracks repaired, and no evidence of soil entering

No. 17 (continued)– Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure
Access Maintenance Hole (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Access Maintenance hole must be at grade or readily accessible at all times
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Cover/lid rocking or noisy	Lid rocking when driven over	Cover/lid not rocking
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Difficult to open	Large access doors or plates cannot be opened/removed using normal equipment	Replace or repair access door so it can opened as designed.
Large Access Doors/Plate (continued)	A	Damaged	Hatch doors show major dents and stress	Replace to support surface loading and uses
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered.	Doors close flat and cover access opening completely.

No. 17 (continued)– Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate.	Lifting rings sufficient to lift or remove door or plate.

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

[2] Inspection frequencies provided are recommendations only. Proprietary technologies shall be inspected on a frequency as recommended by the manufacturer.

No. 18 – API Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A, E	Trash and debris	Any trash or debris which impairs the function of the facility	Trash and debris removed from facility
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Floating oil in excess of 1 inch in first chamber, any oil in other chambers or other contaminants of any type in any chamber	No contaminants present other than a surface oil film
Vault Treatment Area	A, E	Sediment accumulation	Sediment accumulates exceeds 6 inches in the vault	No sediment in the vault.
Vault Treatment Area (continued)	A, E	Discharge water not clear	Inspection of discharge water shows obvious signs of poor water quality-effluent discharge from vault shows thick visible sheen	Effluent discharge is clear
Vault Treatment Area (continued)	A, E	Trash or debris accumulation	Any trash and debris accumulation in vault (floatables and non-floatables)	Vault is clear of trash and debris
Vault Treatment Area (continued)	A, E	Oil accumulation	Oil accumulations that exceed 1 inch, at the surface of the water in the oil/water separator chamber	No visible oil depth on water
Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil particles entering the structure through the cracks Maintenance/inspection personnel determines that the vault is not structurally sound	Vault replaced or repaired to design specifications

No. 18 (continued)– API Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vault Structure (continued)	A	Baffles damaged	Baffles corroding, cracking, warping and/or showing signs of failure	Repair or replace baffles to specifications
Gravity Drain	A	Inoperable valve	Valve will not open and close	Valve opens and closes normally
Gravity Drain (continued)	A	Valve will not seal	Valve does not seal completely	Valve completely seals closed
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks, broken welds, seams or any other conditions that allows water to be discharged from other than the submerged portion of the tee	Water will be discharged from the submerged portion of the tee
Inlet/Outlet Pipe (continued)	A	Missing	When the required inlet or outlet tee is not installed	Tees installed
Inlet/Outlet Pipe (continued)	A	Permanently installed	When the tee is grouted to the inlet or outlet pipe and is not removable to allow for maintenance and inspection	Tee removable for maintenance and inspection
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure
Access Maintenance Hole (continued)	A	Cover/lid not locatable or accessible	Unable to identify/locate or access	Access Maintenance hole must be at grade or readily accessible at all times

No. 18 (continued)– API Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment	Replace or repair access door so it can opened as designed
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and cover access opening completely
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or cover/lid	Lifting rings sufficient to lift or remove cover/lid

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 19 – Coalescing Plate Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A, E	Trash and debris	Any trash or debris which impairs the function of the facility	Trash and debris removed from facility
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Floating oil in excess of 1 inch in first chamber, any oil in other chambers or other contaminants of any type in any chamber	No contaminants present other than a surface oil film
Vault Treatment Area	A, E	Sediment accumulation in the forebay	Sediment accumulation of 6 inches or greater in the forebay	No sediment in the forebay
Vault Treatment Area (continued)	A, E	Discharge water not clear	Inspection of discharge water shows obvious signs of poor water quality – effluent discharge from vault shows thick visible sheen	Repair function of plates so effluent is clear
Vault Treatment Area (continued)	A, E	Trash or debris accumulation	Trash and debris accumulation in vault (floatables and non-floatables)	Trash and debris removed from vault
Vault Treatment Area (continued)	A, E	Oil accumulation	Oil accumulation that exceeds 1 inch at the water surface in the in the coalescing plate chamber	No visible oil depth on water and coalescing plates clear of oil
Coalescing Plates	A	Damaged	Plate media broken, deformed, cracked and/or showing signs of failure	Replace that portion of media pack or entire plate pack depending on severity of failure
Coalescing Plates (continued)	A, E	Sediment accumulation	Any sediment accumulation which interferes with the operation of the coalescing plates	No sediment accumulation interfering with the coalescing plates

No. 19 – Coalescing Plate Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vault Structure	A	Damage to wall, frame, bottom, and/or top slab	Cracks wider than ½ inch Any evidence of soil particles entering the structure through the cracks Maintenance inspection personnel determines that the vault is not structurally sound	Vault replaced or repaired to design specifications
Vault Structure (continued)	A	Baffles damaged	Baffles corroding, cracking, warping and/or showing signs of failure	Repair or replace baffles to specifications
Ventilation Pipes	A	Plugged	Any obstruction to the ventilation pipes	Ventilation pipes are clear
Shutoff Valve	A	Damaged or inoperable	Shutoff valve cannot be opened or closed	Shutoff valve operates normally
Inlet/Outlet Pipe	A	Sediment accumulation	Sediment filling 1/3 or more of the pipe	Inlet/outlet pipes clear of sediment
Inlet/Outlet Pipe (continued)	B, W, E	Trash and debris	Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)	No trash or debris in pipes
Inlet/Outlet Pipe (continued)	A	Damaged	Cracks, broken welds, seams or any other conditions that allows water to be discharged from other than the submerged portion of the tee	Water will be discharged from the submerged portion of the tee
Inlet/Outlet Pipe (continued)	A	Missing	When the required inlet or outlet tee is not installed	Tees installed
Inlet/Outlet Pipe (continued)	A	Permanently installed	When the tee is grouted to the inlet or outlet pipe and is not removable to allow for maintenance and inspection	Tee removable for maintenance and inspection

No. 19 – Coalescing Plate Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Access Maintenance Hole	A	Cover/lid not in place	Cover/lid is missing or only partially in place **Any open maintenance hole requires immediate maintenance**	Maintenance hole access cover/lid in place and secure
Access Maintenance Hole (continued)	A	Locking mechanism not working	Mechanism cannot be opened by one maintenance person with proper tools Bolts cannot be seated Self-locking cover/lid does not work	Mechanism opens with proper tools
Access Maintenance Hole (continued)	A	Cover/lid difficult to remove	One maintenance person cannot remove cover/lid after applying 80 lbs of lift	Cover/lid can be removed and reinstalled by one maintenance person
Access Maintenance Hole (continued)	A	Ladder rungs unsafe	Missing rungs, misalignment, rust, or cracks	Ladder meets design standards and allows maintenance person safe access
Large Access Doors/Plate	A	Damaged or difficult to open	Large access doors or plates cannot be opened/removed using normal equipment.	Replace or repair access door so it can opened as designed
Large Access Doors/Plate (continued)	A	Gaps, does not cover completely	Large access doors not flat and/or access opening not completely covered	Doors close flat and cover access opening completely
Large Access Doors/Plate (continued)	A	Lifting rings missing, rusted	Lifting rings not capable of lifting weight of door or plate	Lifting rings sufficient to lift or remove door or plate

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 20 – Catch Basin Filter Socks

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Media Insert[2]	M	Visible oil	Visible oil sheen passing through media	Media insert replaced
Media Insert[2] (continued)	M	Insert does not fit catch basin properly	Flow gets into catch basin without going through media	All flow goes through media
Media Insert[2] (continued)	M	Filter media plugged	Filter media plugged	Flow through filter media is normal
Media Insert[2] (continued)	M	Oil absorbent media saturated	Media oil saturated	Oil absorbent media replaced
Media Insert[2] (continued)	M	Water saturated	Catch basin insert is saturated with water, which no longer has the capacity to absorb	Insert replaced
Media Insert[2] (continued)	M	Service life exceeded	Regular interval replacement due to typical average life of product	Media replaced at manufacturer's recommended interval

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

[2] Inspection frequencies provided are recommendations only. Catch basin filter socks shall be inspected on a frequency as recommended by the manufacturer.

*In addition to the specific maintenance criteria provided below, all manufacturers' requirements shall be followed.

No. 21 – Proprietary Technology Filterra System

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	A	Life cycle	Once per year, except mulch and trash removal twice per year	Facility is re-inspected and any needed maintenance performed
Facility – General Requirements (continued)	B, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Inlet	B, E	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Inlet should be free of obstructions allowing free distributed flow of water into system
Mulch Cover	B, E	Trash and floatable debris accumulation	Excessive trash and/or debris accumulation	Minimal trash or other debris on mulch cover Mulch cover raked level
Mulch Cover (continued)	B, E	"Ponding" of water on mulch cover	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly through mulch cover
Proprietary Filter Media/ Vegetation Substrate	B, E	"Ponding" of water on mulch cover after mulch cover has been maintained	Excessive fine sediment passes the mulch cover and clogs the filter media/vegetative substrate	Stormwater should drain freely and evenly through mulch cover Replace substrate and vegetation when needed

No. 21 (continued)- Proprietary Technology Filterra System

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vegetation	B, E	Plants not growing or in poor condition	Soil/mulch too wet Evidence of spill Incorrect plant selection Pest infestation Vandalism to plants	Plants should be healthy and pest free
Vegetation (continued)	B, E	Plants not growing or in poor condition	Media/mulch too dry	Irrigation is required
Vegetation (continued)	B, E	Plants absent	Plants absent	Appropriate plants are present
Vegetation (continued)	B, E	Excessive plant growth	Excessive plant growth inhibits facility function or becomes a hazard for pedestrian and vehicular circulation and safety	Pruning and/or thinning vegetation maintains proper plant density Appropriate plants are present
Structure, if used	B	Structure has visible cracks	Cracks wider than ½ inch Evidence of soil particles entering the structure through the cracks	Structure is sealed and structurally sound

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

[2] Inspection frequencies provided are recommendations only. Proprietary technologies shall be inspected on a frequency as recommended by the manufacturer.

*In addition to the specific maintenance criteria provided below, all manufacturers' requirements shall be followed.

No. 22 – Proprietary Technology Modular Wetland System

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	B	Trash and debris	Any trash or debris which impairs the function of the facility	Trash and debris removed from facility
Facility – General Requirements (continued)	B	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Facility – General Requirements (continued)	B	Odor	Septic or foul odor coming from inside the system	Odors are eliminated
Facility – General Requirements (continued)	B	Standing water	Standing water observed after a prolonged dry period	No standing water
Inlet/Outlet Pipe	B	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Inlet should be free of obstructions allowing free distributed flow of water into system
Inlet/Outlet Pipe (continued)	B	Pipe damage or blockage	Pipe damaged or otherwise not functioning properly	Pipe is repaired and allowing free flow of water into system
Pre-Treatment Chamber	B	Sediment accumulation	Sediment accumulation in the pre-treatment chamber	Sediment removed from the pre-treatment chamber
Pre-Treatment Chamber (continued)	B	Access cover damage or difficulty opening	Access cover (manhole cover/grate) is damaged or cannot be opened using normal lifting pressure	Access cover is repaired and can be opened using normal lifting pressure.

No. 22 (continued)– Proprietary Technology Modular Wetland System

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Pre-Treatment Chamber (continued)	B	Obstruction or clogging of screening device	Contaminants and pollutants collected by screen are obstructing flow of water into the system	All pollutants removed and disposed of according to applicable regulations Screen is free of obstructions and allows free flow of water into system
Pre-Treatment Chamber (continued)	B	Accumulated pollutants or debris in separation chamber	Accumulated pollutants or debris impedes function of unit	All pollutants removed and disposed of according to applicable regulations
Filter Media	A	Life cycle	Regular interval replacement due to typical average life of product or clogging	Old filter media is removed and new filter media is installed
Structure	A	Unit shows signs of structural deterioration	Visible cracks wider than ½ inch Evidence of soil particles entering the structure through the cracks Damage to frame	Structure is sealed and structurally sound
Access Cover	A	Hard to open	Cannot be easily opened	Access lid is repaired or replaced
Access Cover (continued)	A	Buried	Buried	Access lid functions as designed (refer to record drawings for design intent)
Access Cover (continued)	A	Missing cover	Cover missing	Cover replaced
Vegetation	B	Plants not growing or in poor condition	Soil/mulch too wet Evidence of spill Incorrect plant selection Pest infestation Vandalism to plants	Plants should be healthy and pest free.

No. 22 (continued)– Proprietary Technology Modular Wetland System

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vegetation (continued)	B	Excessive plant growth	Excessive plant growth inhibits facility function or becomes a hazard for pedestrian and vehicular circulation and safety	Pruning and/or thinning vegetation maintains proper plant density Appropriate plants are present

1 Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

2 Inspection frequencies provided are recommendations only. Proprietary technologies shall be inspected on a frequency as recommended by the manufacturer.

No. 23 – Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	B, E	Pests: Insects/Rodents	Pest of concern is present and impacting facility function	Pests removed or destroyed and facility returned to original functionality Do not use pesticides or *Bacillus thuringiensis israelensis* (*Bti*)
Facility – General Requirements (continued)	A, E	Trash	Trash and debris present	No trash and debris present
Facility – General Requirements (continued)	B, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Earthen Side Slopes and Berms	B, E	Erosion	Erosion (gullies/rills) greater than 2 inches deep around inlets, outlet, and alongside slopes	Cause of erosion is eliminated Damaged area is stabilized (regrade, rock, vegetation, erosion control blanket) For deep channels or cuts (over 3 inches in ponding depth), temporary erosion control measures are in place until permanent repairs can be made.
Earthen Side Slopes and Berms (continued)	B, E	Erosion	Erosion of sides causes slope to become a hazard	The hazard is eliminated and slopes are stabilized

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Earthen Side Slopes and Berms (continued)	A, E	Settlement	Settlement greater than 3 inches (relative to undisturbed sections of berm)	The design height is restored with additional mulch
Earthen Side Slopes and Berms (continued)	A, E	Berm leakage	Downstream face of berm wet, seeps or leaks evident	Holes are plugged and berm is compacted (may require consultation with licensed engineer, particularly for larger berms)
Earthen Side Slopes and Berms (continued)	A, E	Berm leakage	Any evidence of rodent holes or water piping in berm	Rodents (refer to "Pests: Insects/Rodents ") removed or destroyed Berm repaired/compacted
Concrete Sidewalls	A	Cracks	Rot, cracks, or failure of concrete sidewalls	Concrete is repaired or replaced
Rockery Sidewalls	A	Instable rockery	Rockery side walls are insecure	Rockery sidewalls are stable (may require consultation with licensed engineer, particularly for walls 4 feet or greater in height)
Facility Bottom Area	B	Sediment accumulation	Accumulated sediment to extent that infiltration rate is reduced (refer to “Bioretention Soil”) or surface storage capacity significantly impacted	Sediment cleaned out to restore facility shape and depth Damaged vegetation is replaced and mulched Source of sediment identified and controlled (if feasible)
Facility Bottom Area (continued)	B	Leaf accumulation	Accumulated leaves in facility	No leaves clogging outlet structure or impeding water flow

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Check Dams and Weirs	A, E	Sediment, vegetation, or debris accumulation	Sediment, vegetation, or debris accumulated at or blocking (or having the potential to block) check dam, flow control weir, or orifice	Blockage is cleared
Check Dams and Weirs (continued)	A, E	Erosion	Erosion and/or undercutting present	No eroded or undercut areas in bioretention facility Cause of erosion or undercutting addressed Check dam or weir is repaired
Check Dams and Weirs (continued)	A	Unlevel top of weir	Grade board or top of weir damaged or not level	Weir restored to level position
Bioretention Soil	As needed	Ponded water	Water remains in the basin 48 hours or longer after the end of a storm	Cause of ponded water is identified and addressed: 1) Leaf litter/debris is removed 2) Underdrain is clear 3) Other water inputs (e.g., groundwater, illicit connections) investigated 4) Contributing area verified and facility size is evaluated If items #1–4 do not solve the problem, imported bioretention soil is replaced and replanted.
Bioretention Soil (continued)	As needed	Protection of soil	Maintenance will occur requiring entrance into the facility footprint	Maintenance is performed without compacting bioretention soil media
Splash Block Inlet	B	Water not properly directed to facility	Water is not being directed properly to the facility and away from the inlet structure	Blocks are reconfigured to direct water to facility and away from structure

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Curb Cut Inlet/Outlet	A, E	Accumulated debris	Accumulated leaves, sediment, debris or vegetation at curb cuts	Blockage is cleared Source of the blockage is identified and action is taken to prevent future blockages
Inlet/Outlet Pipe	A	Damaged pipe	Pipe is damaged	Pipe is repaired/replaced No cracks more than ¼-inch wide at the joint of inlet/outlet pipes exist
Inlet/Outlet Pipe (continued)	A	Clogged pipe	Pipe is clogged	Pipe is clear
Inlet/Outlet Pipe (continued)	A, E	Accumulated debris	Accumulated leaves, sediment, debris or vegetation at inlet or outlet pipe	Pipe is clear of debris Source of the blockage is identified and action is taken to prevent future blockages
Inlet/Outlet Pipe (continued)	A, E	Blocked access	Maintain access for inspections	Vegetation is cleared within 1 foot of inlets and outlets Access pathways are maintained

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Inlet/Outlet Pipe (continued)	B	Erosion	Water disrupts soil media	No eroded or scoured areas in bioretention facility Cause of erosion or scour addressed. Pipes or splash blocks are reconfigured or repaired A cover of rock or cobbles or other erosion protection measure maintained (e.g., matting) to protect the ground where concentrated water enters or exits the facility (e.g., a pipe, curb cut or swale)
Overflow	A, E	Blocked overflow	Capacity reduced by sediment or debris	No sediment or debris in overflow
Underdrain Pipe	A	Blocked underdrain	Plant roots, sediment or debris reducing capacity of underdrain Prolonged surface ponding (refer to "Bioretention Soil")	Underdrains and orifice are free of sediment and debris

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility Bottom Area and Upland Slope Vegetation	M	Lack of vegetation	Vegetation survival rate falls below 75 percent within first 2 years of establishment (unless project O&M manual or record drawing stipulates more or less than 75 percent survival rate)	Plants are healthy and pest free Cause of poor vegetation growth addressed Bioretention facility is replanted as necessary to obtain 75 percent survival rate or greater Plant selection is appropriate for site growing conditions
Trees and Shrubs	A	Causing problems for operation of facility	Large trees and shrubs interfere with operation of the facility or access for maintenance	Trees and shrubs do not hinder facility performance or maintenance activities
Trees and Shrubs (continued)	A	Dead trees or shrubs	Standing dead vegetation is present	Trees and shrubs do not hinder facility performance or maintenance activities Dead vegetation is removed Cause of dead vegetation is addressed Specific plants with high mortality rate are replaced with more appropriate species

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Trees and Shrubs Adjacent to Vehicle Travel Areas (or areas where visibility needs to be maintained)	A	Safety issues	Vegetation causes some visibility (line of sight) or driver safety issues	Appropriate height for sight clearance is maintained Regular pruning maintains visual sight lines for safety or clearance along a walk or drive Tree or shrub is removed or transplanted if presenting a continual safety hazard
Emergent Vegetation	M	Conveyance blocked	Vegetation compromises conveyance	Sedges and rushes are clear of dead foliage
Noxious Weeds	M (March – October)	Presence of noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Excessive Vegetation	M	Adjacent facilities compromised	Low-lying vegetation growing beyond facility edge onto sidewalks, paths, or street edge poses pedestrian safety hazard or may clog adjacent permeable pavement surfaces due to associated leaf litter, mulch, and soil	Vegetation does not impede function of adjacent facilities or pose as safety hazard Groundcovers and shrubs trimmed at facility edge Excessive leaf litter is removed.

No. 23 (continued)– Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Excessive Vegetation (continued)	M	Causes facility to not function properly	Excessive vegetation density inhibits stormwater flow beyond design ponding or becomes a hazard for pedestrian and vehicular circulation and safety	Pruning and/or thinning vegetation maintains proper plant density and aesthetics Plants that are weak, broken, or not true to form are removed or replaced in-kind Appropriate plants are present
Mulch	A	Lack of mulch	Bare spots (without mulch cover) are present or mulch depth less than 2 inches	Facility has a minimum 3-inch layer of an appropriate type of mulch Mulch is kept away from woody stems
Plant Watering	Weekly or as required (May – September)	Plant establishment	Plant establishment period (1–3 years)	Plants are watered as necessary during periods of no rain to ensure plant establishment
Summer Watering (after establishment)	Weekly or as required (May – September)	Drought period	Established vegetation (after 3 years)	Plants are watered as necessary during drought conditions Trees are watered up to 5 years after planting

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 24 – Cisterns

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Roof	B	Debris accumulation in cistern	Debris has accumulated	No debris in cistern
Gutter	B	Debris accumulation in cistern	Debris has accumulated	No debris in cistern or gutter
Screens at the Top of Downspout and Cistern Inlet	A	Debris accumulation in cistern	Screen has deteriorated or is missing	Screen is in place and functions as designed
Screens at the Top of Downspout and Cistern Inlet (continued)	Monthly (October – April), E	Debris accumulation in cistern	Preventative maintenance	No debris in cistern or accumulated on screen
Overflow Pipe	B	Damaged	Pipe is cracked, joints and fittings not sealed	Overflow pipe is watertight and does not leak.
Overflow Pipe (continued)	B	Discharge is sporadic, cistern overtops	Debris has accumulated blocking flow	Overflow pipe can convey overflow to point of discharge.
Cistern	A	Accumulated debris and/or sediment	More than 6 inches of accumulation in bottom of cistern	Accumulation of debris and/or sediment removed
Low Flow Orifice (detention cistern)	M (October – April), E	Cistern overflows are too frequent	Debris or other obstruction of orifice	Orifice is clear
Delivery and Distribution System (harvesting)	Varies	None – ongoing maintenance activity	Ongoing maintenance (e.g., replacing and/or cleaning filters, removing sediment and other pollutants from storage systems)	Manufacturer's, installer's, or designer's instructions for O&M are followed
Access and Safety	Ongoing	None – ongoing maintenance activity	Access to cistern required for maintenance or cleaning	Any cistern opening that could allow the entry of people is marked: "DANGER—CONFINED SPACE"
Pests	B	Mosquito infestation	Standing water remains for more than 3 days following storms	All inlets, overflows and other openings are protected with mosquito screens No mosquito infestation present

[1] Inspection frequency:

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No. 25 – Downspout, Sheet Flow, and Concentrated Dispersion Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Splash Block	B	Water directed toward building	Water is being directed towards building structure	Blocks direct water away from building structure
Splash Block (continued)	B	Water causing erosion	Water disrupts soil media	Blocks are reconfigured/repaired and media is restored
Transition Zone	B, E	Erosion	Adjacent soil erosion; uneven surface creating concentrated flow discharge; or less than 2 foot of width	No eroded or scoured areas Cause of erosion or scour is addressed
Dispersion Trench	B	Concentrated flow	Visual evidence of water discharging at concentrated points along trench (normal condition is a “sheet flow” from edge of trench; intent is to prevent erosion damage)	No debris on trench surface Notched grade board or other distributor type is aligned to prevent erosion Trench is rebuilt to standards, if necessary
Surface of Trench	A, E	Accumulated debris	Accumulated trash, debris, or sediment on drain rock surface impedes sheet flow from facility	Trash or debris is removed/disposed in accordance with local solid waste requirements
Surface of Trench (continued)	A, E	Vegetation impeding flow	Vegetation/moss present on drain rock surface impedes sheet flow from facility	Freely draining drain rock surface
Pipe(s) to Trench	A	Accumulated debris in drains	Accumulation of trash, debris, or sediment in roof drains, gutters, driveway drains, area drains, etc.	No trash or debris in roof drains, gutters, driveway drains, or area drains
Pipe(s) to Trench (continued)	A	Accumulated debris in inlet pipe	Pipe from sump to trench or drywell has accumulated sediment or is plugged	No sediment or debris in inlet/outlet pipe screen or inlet/outlet pipe

No. 25 (continued)– Downspout, Sheet Flow, and Concentrated Dispersion Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Pipe(s) to Trench (continued)	A	Damaged pipes	Cracked, collapsed, broken, or misaligned drain pipes	No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe
Rock Pad (concentrated flow dispersion)	A	Inadequate rock cover	Only one layer of rock exists above native soil in area 6 square feet or larger, or any exposure of native soil	Rock pad is repaired/replaced to meet design standards
Rock Pad (concentrated flow dispersion) (continued)	A	Erosion	Soil erosion in or adjacent to rock pad	Rock pad is repaired/replaced to meet design standards
Dispersal Area (general)	A	Erosion	Erosion (gullies/rills) greater than 2 inches deep in dispersal area	No eroded or scoured areas Cause of erosion or scour is addressed
Dispersal Area (general) (continued)	A	Accumulated sediment	Accumulated sediment or debris to extent that blocks or channelizes flow path	No excess sediment or debris in dispersal area. Sediment source is addressed (if feasible)
Ponded Water	As needed	Ponded water	Standing surface water in dispersion area remains for more than 3 days after the end of a storm event	System freely drains Standing water in dispersion area does not persist for more than 3 days after a storm event Cause of the standing water (e.g., grade depressions, compacted soil) addressed
Vegetation	M	Plant survival	Dispersal area vegetation in establishment period (1–2 years, or additional 3rd year) during extreme dry weather)	Vegetation healthy and watered weekly during periods of no rain to ensure plant establishment

No. 25 (continued)- Downspout, Sheet Flow, and Concentrated Dispersion Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Vegetation (continued)	M	Lack of vegetation allowing erosion	Poor vegetation cover such that erosion is occurring	Vegetation healthy and watered. No eroded or scoured areas present Cause of erosion or scour addressed Plant species appropriate for the soil and moisture conditions
Vegetation (continued)	M	Vegetation blocking flow	Vegetation inhibits dispersed flow along flow path	Vegetation is trimmed, weeded, or replanted to restore dispersed flow path
Vegetation (continued)	M (March – October)	Presence of noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be
Sump	A	Accumulated sediment	Accumulated sediment in the sump exceeds 30 percent of storage volume	No sediment in sump or inlet/outlet pipes
Access Lid	A	Hard to open	Cannot be easily opened	Access lid is repaired or replaced
Access Lid (continued)	A	Buried	Buried	Access lid functions as designed (refer to record drawings for design intent)
Access Lid (continued)	A	Missing cover	Cover missing	Cover replaced

No. 25 (continued)– Downspout, Sheet Flow, and Concentrated Dispersion Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Pest Control	B	Mosquito infestation	Standing surface water in dispersion area remains for more than 3 days after the end of a storm	System freely drains Standing water in dispersion area does not persist for more than 3 days after a storm event Cause of the standing water (e.g., grade depressions, compacted soil) addressed
Rodents	As required	Presence of rodents	Rodent holes or mounds disturb dispersion flow paths	Rodents removed or destroyed Holes filled Flow path revegetated

[1] Inspection frequency:

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No. 26 – Permeable Pavement1

Maintenance Component	Recommended Inspection Frequency[2]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A	Unstable adjacent area	Runoff from adjacent pervious areas deposits soil, mulch or sediment on paving	No deposited soil or other materials on permeable pavement or other adjacent surfacing All exposed soils that may erode to pavement surface mulched and/or planted
Facility – General Requirements (continued)	A	Wearing course covered by adjacent vegetation	Vegetation growing beyond facility edge onto sidewalks, paths, and street edge	Vegetation does not impede function of adjacent facilities or pose as safety hazard Groundcovers and shrubs trimmed to avoid overreaching the sidewalks, paths and street edge
Facility – General Requirements (continued)	A, E	Contaminants and pollution	Any evidence of contaminants or pollution such as oil, gasoline, concrete slurries, or paint	Materials removed and disposed of according to applicable regulations Source control BMPs implemented if appropriate No contaminants present other than a surface oil film
Pavement Wearing Course (all types)	A	Accumulated sediment on surface	Sediment present at the surface of the pavement	Sediment at surface does not inhibit infiltration

No. 26 (continued)- Permeable Pavement1

Maintenance Component	Recommended Inspection Frequency[2]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Pavement Wearing Course (all types) (continued)	A	Surface clogged by moss	Moss growth inhibits infiltration or poses slip safety hazard	Moss growth on surface does not inhibit infiltration or present a slip safety hazard
Pavement Wearing Course (all types) (continued)	A	Surface is clogged	Ponding on surface or water flows off the permeable pavement surface during a rain event (does not infiltrate)	System drains freely No standing water on surface between storms
Pavement Wearing Course (all types) (continued)	A	Settlement	When deviation from original grade impedes function.	Original grade re-established
Permeable Asphalt or Cement Concrete	A	Cracks	Major cracks or trip hazards and concrete spalling and raveling	Potholes or small cracks filled with patching mixes Large cracks and settlement addressed by cutting and replacing the pavement section
Permeable Paver or Open-Celled Paving Grid	A	Paver block missing or damaged	Paver block missing or damaged	Individual damaged paver blocks removed and replaced or repaired per manufacturer's recommendations
Permeable Paver or Open-Celled Paving Grid (continued)	A	Loss of aggregate material between paver blocks	Loss of aggregate material between paver blocks	Aggregate replaced per manufacturer's recommendations
Open-Celled Paving Grid	A	Paving grid missing or damaged	Three or more adjacent rings in paving grid missing or damaged	Grid segment replaced or repaired per manufacturer's recommendations
Open-Celled Paving Grid (continued)	A	Loss of aggregate material in paving grid	Loss of aggregate material in paving grid	Aggregate gravel level maintained at the same level as the plastic rings or no more than ¼ inch above the top of rings

No. 26 (continued)- Permeable Pavement1

Maintenance Component	Recommended Inspection Frequency[2]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Open-Celled Paving Grid (continued)	A	Lack of grass coverage	Poor grass coverage in paving grid	Growing medium restored Facility reseeded or planted Aerated without damaging grid material Vegetated area amended as needed
Open-Celled Paving Grid (continued)	A	Weeds present	Weeds present	Weeds are removed if infiltration is hindered. Noxious weeds are removed.
Inlet/Outlet Pipe	A	Pipe is damaged	Pipe is damaged	Pipe is repaired/replaced
Inlet/Outlet Pipe (continued)	A	Pipe is clogged	Pipe is clogged	Roots or debris is removed
Inlet/Outlet Pipe (continued)	A, E	Erosion	Native soil exposed or other signs of erosion damage present	No eroded or scoured areas Cause of erosion or scour is addressed
Underdrain Pipe	B	Blocked underdrain	Plant roots, sediment or debris reducing capacity of underdrain (may cause prolonged drawdown period)	Underdrains and orifice free of sediment and debris

[1] Fog seal, chip seal and other impervious overlays are not permitted on top of permeable pavement.[2] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 27 – Trees

Maintenance Component	Recommended Inspection Frequency	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Tree	As needed	Dead or declining	Dead, damaged, or declining	Tree replaced per planting plan or acceptable substitute

No. 28 – Vegetated Roof Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Facility – General Requirements	A	Improper access and safety for maintenance	Insufficient egress/ingress routes and fall protection	Egress and ingress routes maintained to design standards and fire codes Fall protection is appropriate
Facility – General Requirements (continued)	A	Border zone not defined	Vegetation is encroaching into border zone aggregate	No weeds and undesirable vegetation present Desirable vegetation transplanted
Facility – General Requirements (continued)	A	Flashing, gravel stops, utilities, or other structures on roof	Flashing, utilities or other structures on roof are deteriorating (can serve as source of metal pollution in vegetated roof runoff)	Potential pollutant sources replaced or eliminated
Facility – General Requirements (continued)	B	Mosquitoes	Standing water remains for more than 3 days after the end of a storm	System freely drains Standing water on roof does not persist for more than 3 days after a storm event
Facility – General Requirements (continued)	As required	Nuisance animals	Nuisance animals causing erosion, damaging plants, or depositing large volumes of feces	Measures in place to deter nuisance species
Growth Medium	A	Water is not infiltrating properly	Water does not permeate growth media (runs off soil surface) or crusting is observed	Stormwater infiltrates freely through growth media
Growth Medium (continued)	A	Insufficient growth medium	Growth medium thickness is less than design thickness (due to erosion and plant uptake)	Growth medium is present at design thickness
Growth Medium (continued)				
Growth Medium (continued)	A	Erosion	Growth media erosion/scour is visible (e.g., gullies)	No eroded or scoured areas Cause of erosion or scour addressed

No. 28 (continued)- Vegetated Roof Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Roof Drain	B, E	Not draining	Sediment, vegetation, or debris reducing capacity of inlet structure	Inlet clear Cause of blockage addressed
Roof Drain (continued)	A	Pipe is clogged	Pipe is clogged	Debris, roots, or other obstruction removed and pipe is free draining
Vegetation	B	Plant coverage	Vegetative coverage falls below 80 percent (unless design specifications stipulate less than 80 percent coverage)	Bare areas planted with vegetation Erosion control measures installed until percent coverage goal attained
Vegetation (continued)	B	Plant coverage (continued)	Summer watering – extensive vegetated roof system	Vegetation watered weekly during periods of no rain during vegetation establishment period (1–2 years)
Vegetation (continued)	B	Plant coverage (continued)	Summer watering – extensive vegetated roof system (continued)	Vegetation watered during drought conditions or more often if necessary to maintain plant cover during post-establishment period (after 2 years)
Vegetation (continued)	B	Plant coverage (continued)	Summer watering – intensive vegetated roof system	Vegetation watered deeply, but infrequently, and the top 6 to 12 inches of the root zone is moist during vegetation establishment period (1–2 years)
Vegetation (continued)	B	Plant coverage (continued)	Summer watering – intensive vegetated roof system (continued)	Vegetation watered during drought conditions or more often if necessary to maintain plant cover during post-establishment period (after 2 years)

No. 28 (continued)- Vegetated Roof Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Vegetation (continued)	B	Plant coverage (continued)	Extensive roof with low density sedum population	Sedums are mulch mowed
Vegetation (continued)	A	Poor plant establishment and possible nutrient deficiency in growth medium	Fertilization– extensive vegetated roof system	Organic debris replenished Annual soil test conducted to assess need for fertilizer Minimal amounts of slow-release fertilizer applied
Vegetation (continued)	A	Poor plant establishment and possible nutrient deficiency in growth medium (continued)	Fertilization– intensive vegetated roof system	Annual soil test conducted to assess need for fertilizer Minimal amounts of slow-release fertilizer applied
Vegetation (continued)	A	Poor plant establishment and possible nutrient deficiency in growth medium (continued)	Dead vegetation is present	Dead plant material recycled on the roof or removed and replaced (see manufacturer's recommendations)
Vegetation (continued)	Q	Weeds	Weeds are present	Weeds removed (manual methods preferred) IPM protocols followed
Vegetation (continued)	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation which may constitute a hazard to City personnel or the public	Noxious and nuisance vegetation removed according to applicable regulations No danger of noxious vegetation where City personnel or the public might normally be

No. 28 (continued)- Vegetated Roof Systems

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Irrigation System (if any)	Based on manufacturer's instructions	Not applicable	Irrigation system is not working or routine maintenance needed	Manufacturer's/installer's instructions are followed for operation and maintenance

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves

No. 29 – Rain Gardens

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Facility – General Requirements	B, E	Mosquitoes	Standing water remains for more than 3 days after the end of a storm	Rain garden drains freely Standing water in rain garden does not persist for more than 3 days after a storm event Cause of the standing water addressed (see "Ponded water")
Facility – General Requirements (continued)	A, E	Trash	Trash and debris present	No trash or debris present
Earthen Side Slopes and Berms	B, E	Erosion	Persistent soil erosion on slopes	No eroded or scoured areas Cause of erosion or scour addressed
Rockery Sidewalls	A	Unstable rockery	Rockery side walls are insecure	Stable rockery sidewalls (may require consultation with licensed engineer, particularly for walls 4 feet or greater in height)
Rain Garden Bottom Area	B	Sediment accumulation	Visible sediment deposition in the rain garden that reduces drawdown time of water in the rain garden	No sediment accumulation in rain garden Source of sediment addressed
Rain Garden Bottom Area (continued)	B	Debris accumulation	Accumulated leaves in facility	No leaves clogging outlet structure or impeding water flow
Mulch	A	Lack of mulch	Bare spots (without mulch cover) are present or mulch depth less than 2 inches	Facility has a minimum 2- to 3-inch layer of an appropriate type of mulch Mulch kept away from woody stems

No. 29 (continued)– Rain Gardens

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Splash Block Inlet	B	Water not properly directed to rain garden	Water is being directed towards building structure	Blocks are reconfigured to direct water to rain garden and away from structure
Pipe Inlet/Outlet	B	Erosion	Rock or cobble removed or missing and concentrated flows contacting soil	No eroded or scoured areas Cause of erosion or scour addressed Cover of rock or cobbles protects the ground where concentrated water flows into the rain garden
Pipe Inlet/Outlet (continued)	A	Accumulated debris	Accumulated leaves, sediment, debris or vegetation at curb cuts, inlet or outlet pipe	Blockage cleared
Pipe Inlet/Outlet (continued)	A	Damaged pipe	Pipe is damaged	Pipe repaired/replaced
Pipe Inlet/Outlet (continued)	A	Clogged pipe	Pipe is clogged	Pipe clear of roots and debris
Pipe Inlet/Outlet (continued)	A	Blocked access	Maintain access for inspections	Vegetation cleared or transplanted within 1 foot of inlets and outlets
Ponded Water	As needed	Ponded water	Excessive ponding water: Ponded water remains in the rain garden more than 48 hours after the end of a storm	Rain garden drains freely Standing water in rain garden does not persist for more than 48 hours after a storm event Leaf litter/debris/sediment removed
Overflow	A, E	Blocked overflow	Capacity reduced by sediment or debris	No sediment or debris in overflow

No. 29 (continued)– Rain Gardens

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Vegetation	A	Blocked site distances and sidewalks	Vegetation inhibits sight distances and sidewalks	Sidewalks and sight distances along roadways and sidewalks are kept clear
Vegetation (continued)	A	Blocked pipes	Vegetation is crowding inlets and outlets	Inlets and outlets in rain garden clear of vegetation
Vegetation (continued)	M	Unhealthy vegetation	Yellowing: possible Nitrogen (N) deficiency Poor growth: possible Phosphorous (P) deficiency Poor flowering, spotting or curled leaves, or weak roots or stems: possible Potassium (K) deficiency	Plants are healthy and appropriate for site conditions
Vegetation (continued)	M	Weeds	Presence of weeds	Weeds removed (manual methods preferred) and mulch applied
Summer Watering (years 1–3)	Weekly or as required (May – September)	Plant establishment	Tree, shrubs and groundcovers in first 3 years of establishment period	Plants are watered during plant establishment period (years 1–3)
Summer Watering (after establishment)	As needed	Drought conditions	Vegetation requires supplemental water	Plants are watered during drought conditions or more often if necessary during post-establishment period (after 2 years)

[1] Inspection frequency:

A = Annually; B = Biannually; M = Monthly; E = Recommend that additional inspections be performed as appropriate after major events (e.g., >1 inch of precipitation in 24 hours or environmental incident that causes contaminant release; Q = Quarterly (four times per year); W = Recommend that at least one inspection occur during the wet season, preferably after trees have lost their leaves