APPENDIX G

Stormwater Control Operations and Maintenance Requirements

City of Seattle | Stormwater Manual

July 2026

City of Seattle

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 2024) 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.

Materials removed shall be disposed of according to applicable regulations. Refer to *Volume 4, Section 2.1.3. BMP 3: Dispose of Fluids and Wastes Properly*.

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 that exceeds 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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
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.
	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).

No. 1 – 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	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.
	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 the source of erosion.
	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 re-seeded if necessary to control erosion.
	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.

No. 1 – 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)	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.
Emergency Overflow/Spillway	A	Tree growth	Tree growth impedes flow or threatens stability of spillway.	Trees removed.
	A	Rock missing	Only one layer of rock exists above native soil in an 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 that exceeds 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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
	A	Grass/groundcover	Grass or groundcover exceeds 18 inches in height.	Grass or groundcover mowed to a height no greater than 6 inches.
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.

No. 2 – 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	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.
	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 the source of erosion.
	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 of sediment is present or a percolation test indicates facility is working at or less than 90 percent of design.	Facility infiltrates as designed.
	A	Liner damaged (if applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.

No. 2 – Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Tank Structure	A	Plugged air vent	Any blockage of the vent.	Tank or vault freely vents.
	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.
	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.
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.
	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 ¼inch 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 – 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.
	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.
	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 be opened as designed.
	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.
	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	Six inches or more of sediment has accumulated.	Pre-settling occurs as designed.
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 rainstorms.	Rock filter replaced; evaluate need for filter and remove if not necessary.

No. 2 – Infiltration BMPs

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Infiltration Pond Emergency Overflow Spillway	A	Rock missing	Only one layer of rock exists above native soil in an area 5 square feet or larger, or any exposure of native soil at the top of outflow path of spillway. Rip-rap on inside slopes need not be replaced.	Spillway restored to design standards.
	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.

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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.
	A	Sediment accumulation	Accumulated sediment depth exceeds 10 percent of the diameter of the storage area for ½ the 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.
	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.
	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 – 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
	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.
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.
	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.
	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.
	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. 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
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 open as designed.
	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.
	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

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), and overflow elevation. Reference Standard Plans No. 270, 271, and 272.

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Structure	A	Trash and debris	Trash or debris of more than ½ cubic foot that 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.
			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.
			Deposits of garbage exceeding 1 cubic foot in volume.	No condition present that would attract or support the breeding of insects or rodents.
	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 – 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.
			Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
			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.
	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.
			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 ¼inch wide at the joint of inlet/outlet pipe.
	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.
	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.

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
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.
	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.
			Structure is not in upright position (allow up to 10 percent from plumb).	Structure is in correct position.
			Connections to outlet pipe are not watertight or show signs of deteriorated grout.	Connections to outlet pipe are watertight; structure repaired or replaced and works as designed.
			Any holes—other than designed holes—in the structure.	Structure has no holes other than designed holes.
Shear Gate (if applicable)	A	Damaged or missing	Cleanout gate is missing.	Replace cleanout gate.
			Cleanout gate is not watertight.	Gate is watertight and works as designed.
			Gate cannot be moved up and down by one maintenance person.	Gate moves up and down easily and is watertight.

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
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.
	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.
	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.
	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 ¼inch wide at the joint of the inlet/outlet pipe.
Metal Grates (if applicable)	A	Unsafe grate opening	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	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. Materials removed and disposed of according to applicable regulations.
	A	Damaged or missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

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
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.
	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.
	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.
	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.
	B, W, E	Trash and debris	Trash or debris of more than ½ cubic foot that 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 the catch basin.
	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 of the lowest pipe into or out of the basin.	No trash or debris in the catch basin.
	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.
	A	Trash and debris (continued)	Deposits of garbage exceeding 1 cubic foot in volume.	No condition present that would attract or support the breeding of insects or rodents.

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 (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.
			Top slab has holes larger than 2 square inches or cracks wider than ¼ inch.	Top slab is free of holes and cracks.
			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.
	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.
			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 ¼inch wide at the joint of inlet/outlet pipe.
	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.
	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 ¼inch wide at the joint of inlet/outlet pipes.

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 (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.
	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 ¼inch 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.
	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.
	A	Damaged	Cracks, broken welds, seams, or any other conditions that allow 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.
	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. Materials removed and disposed of according to applicable regulations.

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
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.
	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.
	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.
	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. 6 – Reserved

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.
	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 that 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.
	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 missing or entire barrier missing	Bars in place according to design.
			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.
	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 a 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.
	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.
	A	Perforations plugged	Over 1/4 of perforations in pipe are plugged with debris or sediment.	Perforations freely discharge flow.
	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.
	A	Receiving area over-saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
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.

No. 8 – Energy Dissipaters

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
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.
	A	Collapsed or deformed baskets	Gabion basket shape deformed due to any cause.	All gabion baskets intact, structure stands as designed.
	A	Missing rock	Any rock missing that could cause gabion to lose structural integrity.	No rock missing.
Maintenance Hole/Chamber	A	Worn or damaged post, baffles, or side of chamber.	Structure dissipating flow deteriorates to ½ of original size or any concentrated worn spot exceeding 1 square foot, which would make structure unsound.	Structure in no danger of failing.
	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.
	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

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.
	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 of the biofiltration swale.
			Sediment inhibits grass growth over 10 percent of swale length.	Grass growth not inhibited by sediment.
			Sediment inhibits even spreading of flow.	Flows are spread evenly over entire swale width.
	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.
	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.
	B	Grass too tall	Grass is excessively tall (greater than 10 inches) **and** impedes swale performance (i.e., flow control or water quality). Grass is thin Nuisance weeds and other vegetation have taken over.	Grass between 3 and 4 inches tall, thick and healthy. No clippings left in swale. No nuisance vegetation present.

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
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.
	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.
	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.
	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.
	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 ¼inch 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. 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.
	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.
	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.
	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.
	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.
	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.

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
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 ¼inch 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. 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.
	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.
	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.
	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.
	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 – 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 ¼inch wide at the joint of the inlet/outlet pipe.

[1] Inspection frequency:

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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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
	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 – 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 trees do not need to be removed.	Trees do not hinder facility performance or maintenance activities.
	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.
	A	Irregular surface on internal berm	Top of berm not uniform and level.	Top of berm graded to design elevation.
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.

No. 12 – Wet Ponds

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed
Pond Areas (continued)	A	Sediment accumulation (first wet pool cell)	Sediment accumulation in pond bottom that exceeds the depth of sediment storage (1 foot) plus 6 inches.	Sediment storage contains no sediment.
	A	Liner damaged (if applicable)	Liner is visible. Pond does not hold water as designed.	Liner repaired or replaced.
	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.
	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.
	A	Rock missing	Only one layer of rock exists above native soil in an area 5 square feet or larger. Any exposure of native soil at the top of outflow 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.
	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. 12 – 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 (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 ¼inch 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.
	A	Sediment accumulation	Sediment accumulation in vault bottom exceeds the depth of the sediment zone plus 6 inches.	No sediment in vault.
	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.
	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.
	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.

No. 13 – Wet 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.
	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 ¼inch 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.
	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.
	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.
	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.
	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.
	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 cover access opening completely.
	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.

No. 13 – 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	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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
	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 – 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
	A	Erosion	Erosion 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.
	A	Irregular surface on internal berm	Top of berm not uniform and level.	Top of berm graded flat to design elevation.
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.

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
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.
	A	Liner damaged (if applicable)	Liner is visible or pond does not hold water as designed.	Liner repaired or replaced.
	A, W	Water level (first cell/forebay)	Cell does not hold 3 feet of water year-round.	3 feet of water retained year-round.
	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.
	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).
	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.
	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.
	A	Rock missing	Only one layer of rock exists above native soil in an area 5 square feet or larger. Any exposure of native soil at the top of outflow 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.

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
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 ¼inch wide at the joint of the inlet/outlet pipe.

[1] Inspection frequency:

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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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
	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.
	A	Liner damaged (if applicable)	Liner is visible. Pond does not hold water as designed.	Liner repaired or replaced.
	A, W	Water level	Cell empty; does not hold water.	Water retained in first cell for most of the year.
	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.

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
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.
	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.
	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.

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
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.
	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.
	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.
	A	Media thickness	Sand thickness is less than 6 inches.	Rebuild sand thickness to a minimum of 6 inches and preferably to 18 inches.
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.
	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. 15 – Sand Filter Basins

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 ¼inch 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 an 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.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
	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.
	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.
	A	Trash and debris	Trash and debris accumulated in vault (floatables and non-floatables)	No trash or debris in vault.
	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.

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
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	Damage 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.
	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.
	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 ¼inch 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. 16 – Sand Filter 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.
	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.
	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.
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 open as designed.
	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.
	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. 17 – Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

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

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 that impairs the function of the facility.	Trash and debris removed from facility. Flow receives treatment instead of bypassing.
	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.
	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.
	Varies – Refer to Manufacturer's requirements.	Sediment on top of cartridges	Varies – Refer to Manufacturer's requirements.	Vault is free of sediment.
	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.
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.
	A	Baffles damaged	Baffles corroding, cracking, warping, and/or showing signs of failure.	Repair or replace baffles to specification.

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

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

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
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.
	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.
	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.	Cracks repaired, and no evidence of soil entering.
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.
	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.
	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. 17 – Proprietary Technology Filter Cartridge Systems (example: BayFilter, FloGard PerkFilter, StormFilter)

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

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition 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.
	A	Cover/lid rocking or noisy	Lid rocking when driven over.	Cover/lid not rocking.
	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 open as designed.
	A	Damaged	Hatch doors show major dents and stress.	Replace to support surface loading and uses.
	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.
	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 that impairs the function of the facility.	Trash and debris removed from facility.
	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 accumulation exceeds 6 inches in the vault.	No sediment in the vault.
	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.
	A, E	Trash or debris accumulation	Any trash and debris accumulation in vault (floatables and non-floatables).	Vault is clear of trash and debris.
	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.
	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.
	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.

No. 18 – API Oil/Water Separators

Maintenance Component	Recommended Inspection Frequency[1]	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
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.
	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, broken welds, seams, or any other conditions that allow water to be discharged from other than the submerged portion of the tee.	Water will be discharged from the submerged portion of the tee.
	A	Missing	When the required inlet or outlet tee is not installed.	Tees installed.
	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.
	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.
	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.
	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.

No. 18 – 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	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 open as designed.
	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.
	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 that impairs the function of the facility.	Trash and debris removed from facility.
	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.
	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.
	A, E	Trash or debris accumulation	Trash and debris accumulation in vault (floatables and non-floatables).	Trash and debris removed from vault.
	A, E	Oil accumulation	Oil accumulation that exceeds 1 inch at the water surface 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.
	A, E	Sediment accumulation	Any sediment accumulation that 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.
	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.
	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, broken welds, seams, or any other conditions that allow water to be discharged from other than the submerged portion of the tee.	Water will be discharged from the submerged portion of the tee.
	A	Missing	When the required inlet or outlet tee is not installed.	Tees installed.
	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.
	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.
	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.
	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 open as designed.
	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.
	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.
	M	Insert does not fit catch basin properly	Flow gets into catch basin without going through media.	All flow goes through media.
	M	Filter media plugged	Filter media plugged.	Flow through filter media is normal.
	M	Oil absorbent media saturated	Media is oil saturated.	Oil-absorbent media replaced.
	M	Water saturated	Catch basin insert is saturated with water, which no longer has the capacity to absorb.	Insert replaced.
	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.

No. 21 – Proprietary Technology Filterra System

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

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.
	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.
	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.
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.
	B, E	Plants not growing or in poor condition	Media/mulch too dry.	Irrigation is required.

No. 21 – Proprietary Technology Filterra System

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

Maintenance Component	Recommended Inspection Frequency[1,2]	Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Vegetation (continued)	B, E	Plants absent	Plants absent.	Appropriate plants are present.
	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.

No. 22 – Proprietary Technology Modular Wetland System

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

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 that impairs the function of the facility.	Trash and debris removed from facility.
	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.
	B	Odor	Septic or foul odor coming from inside the system.	Odors are eliminated.
	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.
	B	Pipe damage or blockage	Pipe damaged or otherwise not functioning properly.	Pipe is repaired, 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.
	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.
	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.

No. 22 – Proprietary Technology Modular Wetland System

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

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	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.
	A	Buried	Buried.	Access lid functions as designed (refer to record drawings for design intent).
	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.
	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*).
	A, E	Trash	Trash and debris present.	No trash and debris present.
	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.
	B, E	Erosion	Erosion of sides causes slope to become a hazard.	The hazard is eliminated and slopes are stabilized.
	A, E	Settlement	Settlement greater than 3 inches (relative to undisturbed sections of berm).	The design height is restored with additional mulch.

No. 23 – 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	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).
			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).
	B	Leaf accumulation	Accumulated leaves in facility.	No leaves clogging outlet structure or impeding water flow.
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.

No. 23 – 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 (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.
	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.
	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.
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.

No. 23 – 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	A	Damaged pipe	Pipe is damaged.	Pipe is repaired/replaced. No cracks more than ¼inch wide at the joint of inlet/outlet pipes exist.
	A	Clogged pipe	Pipe is clogged	Pipe is clear.
	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.
	A, E	Blocked access	Maintain access for inspections.	Vegetation is cleared within 1 foot of inlets and outlets. Access pathways are maintained.
	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.

No. 23 – Bioretention Facilities

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
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.
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 attain 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
	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 – 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 that 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 – 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 3inch 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.
	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.
	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.

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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 toward building structure.	Blocks direct water away from building structure.
	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.
	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.
	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 – 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 ¼inch 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 an area 6 square feet or larger, or any exposure of native soil.	Rock pad is repaired/replaced to meet design standards.
	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.
	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 – 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.
	M	Vegetation blocking flow	Vegetation inhibits dispersed flow along flow path.	Vegetation is trimmed, weeded, or replanted to restore dispersed flow path.
	M (March – October)	Presence of noxious weeds	Any noxious or nuisance vegetation that 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.
	A	Buried	Buried.	Access lid functions as designed (refer to record drawings for design intent).
	A	Missing cover	Cover missing.	Cover replaced.

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
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 Pavement[1]

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.
	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.
	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.
	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.
	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.
	A	Settlement	When deviation from original grade impedes function.	Original grade re-established.

No. 26 – Permeable Pavement[1]

Maintenance Component	Recommended Inspection Frequency[2]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
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.
	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.
	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.
	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.
	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.

No. 26 – Permeable Pavement[1]

Maintenance Component	Recommended Inspection Frequency[2]	Defect or Problem	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Inlet/Outlet Pipe (continued)	A	Pipe is clogged	Pipe is clogged.	Roots or debris are removed.
	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:

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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	Tree needs pruning to maintain health or otherwise required	Depends on tree species / location.	Prune trees per industry standards (ANSI A300 standards) to preserve health and longevity of trees and avoid damage.
	As needed	Roots damaged by structures weighing down or blocking water and nutrients reaching roots	Structures or vehicles encroach on the tree's drip line (root zone).	Tree free of structures or vehicles over the root zone.
Newly Planted Tree within first 5 years	As needed	Dead or declining	Dead, damaged, or declining in first 5 years.	Tree replaced per planting plan or acceptable substitute.
Retained Tree or Newly Planted Tree after 5 years	As needed	Dead or declining	Dead, damaged, or declining, indicated by no leaves on a tree in summer.	Tree evaluated and treated by a certified arborist if Tier 1, 2, or 3 tree per SMC 25.11 Tree Protection. If tree continues to decline or die it must be replaced with an acceptable substitute.
Retained and Newly Planted Tree	Annual	Poor soil moisture and absorption	No mulch or sparse mulch (less than 2 inches thick).	Mulch annually with a 2- to 4-inch thick layer of arborist wood chips in a donut shape around the tree spaced at a hand's-width from the tree base to improve soil moisture and rainfall absorption.
	As needed	Weeds around tree and damage to tree bark and base	Weeds around base of the tree.	Mulch annually, per box above. Tree protected from string trimmers and mowers.
Newly Planted Tree	Annual	Lack of water during growing season	Appears wilted in summer, may have some dead leaves. Preventative requirement to water new plants weekly throughout growing season.	Tree provided with supplemental irrigation of 15-20 gallons of water twice a week for at least 5 growing seasons after planting.

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.
	A	Border zone not defined	Vegetation is encroaching into border zone aggregate.	No weeds and undesirable vegetation present. Desirable vegetation transplanted.
	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.
	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.
	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.
	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.
	A	Erosion	Growth media erosion/scour is visible (e.g., gullies).	No eroded or scoured areas. Cause of erosion or scour addressed.

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
Roof Drain	B, E	Not draining	Sediment, vegetation, or debris reducing capacity of inlet structure.	Inlet clear. Cause of blockage addressed.
	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.
			Summer watering – extensive vegetated roof system.	Vegetation watered weekly during periods of no rain during vegetation establishment period (1–2 years).
			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).
			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).
			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 – 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.
	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.
			Fertilization– intensive vegetated roof system.	Annual soil test conducted to assess need for fertilizer. Minimal amounts of slow-release fertilizer applied.
			Dead vegetation is present.	Dead plant material recycled on the roof or removed and replaced (see manufacturer's recommendations).
	Q	Weeds	Weeds are present.	Weeds removed (manual methods preferred). IPM protocols followed.
	M (March – October)	Noxious weeds	Any noxious or nuisance vegetation that 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.
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:

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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").
	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.
	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 3inch layer of an appropriate type of mulch. Mulch kept away from woody stems.

No. 29 – 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 toward 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.
	A	Accumulated debris	Accumulated leaves, sediment, debris, or vegetation at curb cuts, inlet, or outlet pipe.	Blockage cleared.
	A	Damaged pipe	Pipe is damaged.	Pipe repaired/replaced.
	A	Clogged pipe	Pipe is clogged.	Pipe clear of roots and debris.
	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.
Vegetation	A	Blocked site distances and sidewalks	Vegetation inhibits sight distances and sidewalks.	Sidewalks and sight distances along roadways and sidewalks are kept clear.

No. 29 – Rain Gardens

Maintenance Component	Recommended Inspection Frequency[1]	Defect or Problem	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Vegetation (continued)	A	Blocked pipes	Vegetation is crowding inlets and outlets.	Inlets and outlets in rain garden clear of vegetation.
	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.
	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.