ВМР Туре	Description/Function	Timeline for Required Maintenance
Filtration Practice (Dry	Filtration practices are the process of removing	Immediate Attention is needed for:
Swale, Wet Swale,	suspended solids from the stormwater by passing the	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
Filtration Basin, etc.)	water through a bed of porous media consisting of sand	 If observe pose a hazard to the public or environment, call the city at 218 730 4100.
	or soil. In filtration, the solids that are removed from	Maintenance is needed "before the next rainfall" for:
*See link to example of	the water are retained by the filter media.	 Completely clogged inlet or overflow
Surface Sand Filer Plan		• Standing water more than 48 hours after runoff has entered the practice (determine the cause)
& Profile <u>here</u>	Summary: Filtration is the process of water passing	 Significant erosion on the banks or within the basin
(provided by the	through a porous medium to remove particles to	• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent r
Minnesota Stormwater	remove pollutants and rate control.	infrastructure may result
Manual).		Maintenance is needed "before the next rainy season" for:
		• Emergency overflow repairs
		 Partially clogged inlet or overflow
		 Misaligned inlet or overflow structures that have resulted in some erosion
		• Significant sediment deposition or a layer of silts or clays (capacity testing for scheduling)
		Litter, large debris, and solid waste
		 Sediment deposition downstream of the practice
		Erosion downstream of the practice
		Excessive or invasive vegetation
		Maintenance is needed "within a year or two" for:
		 Misaligned inlet/outlet structures that have not resulted in erosion
		 Some sediment deposition (capacity testing for scheduling)
Infiltration Practice	Infiltration practices operate by capturing and	Immediate Attention is needed for:
(Infiltration	temporarily storing stormwater, before allowing it to	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
Basin/Trench)	infiltrate into the underlying native soil. The infiltrated	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
	water is then partitioned into groundwater recharge,	Maintenance is needed "before the next rainfall" for:
*See link to example of	discharge through an underdrain (if applicable), and	Completely clogged inlet or overflow
Infiltration Basin Plan &	transpiration. By performing this process, these	• Standing water more than 48 hours after runoff has entered the practice (determine the cause)
Profile <u>here</u> (provided	practices provide two fundamental functions in	 Significant erosion on the banks or within the basin
by the Minnesota	stormwater management: attenuation of runoff volume	• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent r
Stormwater Manual).	and treatment of the runoff. These functions may	infrastructure may result
	ultimately reduce stormwater pollutants, increase	Maintenance is needed "before the next rainy season" for:
	groundwater recharge, decrease runoff peak flow rates,	Emergency overflow repairs
	and decrease the volume of stormwater runoff.	Partially clogged inlet or overflow
		 Misaligned inlet or overflow structures that have resulted in some erosion
	Summary: Infiltration is the process of water soaking	 Vegetation coverage less than 50% of the design coverage
	into the ground. Infiltration helps recharge groundwater	 Significant sediment deposition (capacity testing for scheduling)
	and reduce runoff volume.	Litter, large debris, and solid waste
		 Sediment deposition downstream of the practice
	* Infiltration practices are uncommon in Duluth due to	Erosion downstream of the practice
	clay soil but can be found in Park Point.	Excessive or invasive vegetation
		Maintenance is needed "within a year or two" for:
		 Misaligned inlet/outlet structures that have not resulted in erosion
		 Some sediment deposition (capacity testing for scheduling)

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ВМР Туре	Description/Function	Timeline for Required Maintenance
Wet Pond (also known	Are basins that have a permanent pool of water (or	Immediate Attention is needed for:
as Stormwater Pond,	throughout the wet season). The primary pollutant	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
Wet Retention Pond,	removal mechanisms are sediment settling and	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
Wet Extended	pollutant uptake, particularly of nutrients, through	Maintenance is needed "before the next rainfall" for:
Detention Pond)	biological activity in the pond.	Completely clogged inlet or overflow
		 Significant erosion on the banks or within the basin
*See link to example of		• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent re-
Typical Wet Pond Plan		infrastructure may result
& Profile <u>here</u>		Maintenance is needed "before the next rainy season" for:
(provided by the		Emergency overflow repairs
Minnesota Stormwater		• Partially clogged inlet or overflow
Manual).		Misaligned inlet or overflow structures that have resulted in some erosion
		Significant sediment deposition (capacity testing for scheduling)
		• Litter, large debris, and solid waste
		Sediment deposition downstream of the practice
		• Erosion downstream of the practice
		Excessive or invasive vegetation
		Maintenance is needed "within a year or two" for:
		Misaligned inlet/outlet structures that have not resulted in erosion
		Some sediment deposition (capacity testing for scheduling)
Dry Pond (also known	Are basins that detain stormwater for some minimum	Immediate Attention is needed for:
as Dry Detention Pond,	time (e.g., 24 hours) to allow particles and pollutants to	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
Extended	settle and reduce peak flow rates. They do not have	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
Detention Basin,	large permanent pools of water—unlike wet ponds,	Maintenance is needed "before the next rainfall" for:
Detention Pond and	though they often have small pools at the inlet and	Completely clogged inlet or overflow
Extended	outlet of the basin.	• Standing water more than 48 hours after runoff has entered the practice (determine the cause)
Detention Pond)		 Significant erosion on the banks or within the basin
		• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent re
*See link to example of		infrastructure may result
Detention Shallow		Maintenance is needed "before the next rainy season" for:
Wetland Plan & Profile		Emergency overflow repairs
here (provided by the		• Partially clogged inlet or overflow
Minnesota Stormwater		Misaligned inlet or overflow structures that have resulted in some erosion
Manual).		Significant sediment deposition (capacity testing for scheduling)
		• Litter, large debris, and solid waste
		Sediment deposition downstream of the practice
		Erosion downstream of the practice
		Maintenance is needed "within a year or two" for:
		Misaligned inlet/outlet structures that have not resulted in erosion
		• Some sediment deposition (capacity testing for scheduling)

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ВМР Туре	Description/Function	Timeline for Required Maintenance
Permeable	A pavement/paver system that allows the movement of	Immediate Attention is needed for:
Pavement/Pavers	stormwater through the pavement surface and into a	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
	base/subbase reservoir. Examples include pervious	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
	concrete, porous asphalt and permeable pavers/blocks.	Maintenance is needed "before the next rainfall" for:
		• Standing water more than 48 hours after runoff has entered the practice (determine the cause)
		Maintenance is needed "before the next rainy season" for:
		 Significant sediment deposition (capacity testing for scheduling)
		Litter, large debris, and solid waste
		Maintenance is needed "within a year or two" for:
		 Some sediment deposition (capacity testing for scheduling)
Bioretention Practice	Bioretention practices, such as rain gardens, are	Immediate Attention is needed for:
(Rain Garden)	landscape depressions that treat on-site stormwater	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
	discharged from impervious surfaces such as roofs,	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
*See link to example of	driveways, sidewalks, parking lots and compacted	Maintenance is needed "before the next rainfall" for:
Bioinfiltration with no	lawns. They are used to collect stormwater and filter it	Completely clogged inlet or overflow
underdrain figure <u>here</u>	through a mixture of soil, sand and/or gravel. The	• Standing water more than 48 hours after runoff has entered the practice (determine the cause)
(provided by the	designs of bioretention practice mimic volume	 Significant erosion on the banks or within the basin
Minnesota Stormwater	reduction and pollutant removal mechanisms that work	• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent re
Manual).	in natural systems. The filtered stormwater soaks into	infrastructure may result
	the ground, provides water to plants and can help	Maintenance is needed "before the next rainy season" for:
*See link to example of	recharge the local groundwater supply. Through these	 Partially clogged inlet or overflow
Biofiltration with	processes, bioretention practices reduce peak flows	 Misaligned inlet or overflow structures that have resulted in some erosion
underdrain at bottom	within downstream sewer systems and allow pollutant	 Vegetation coverage less than 50% of the design coverage
figure <u>here</u> (provided	removal through filtration and plant uptake.	 Significant sediment deposition (capacity testing for scheduling)
by the Minnesota		 Litter, large debris, and solid waste
Stormwater Manual).		 Sediment deposition downstream of the practice
		Erosion downstream of the practice
		Excessive or invasive vegetation
		Maintenance is needed "within a year or two" for:
		 Misaligned inlet/outlet structures that have not resulted in erosion
		 Some sediment deposition (capacity testing for scheduling)
Underground	Sedimentation is the process by which solids are	DO NOT ENTER underground structures/confined spaces unless you are a trained professional.
Sedimentation Device	removed from the water column by settling.	Immediate Attention is needed for:
(Underground Sand	Sedimentation practices typically consist of engineered	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
Filter, Chamber,	underground vessels that decrease the flow velocity	• If observe pose a hazard to the public or environment, call the city at 218 730 4100.
Sediment Control	and/or the mixing and provide temporary storage of	Maintenance is needed "before the next rainfall" for:
Structure, etc.)	stormwater runoff to allow suspended solids to settle	Completely clogged inlet or overflow
	and be retained by the stormwater treatment practice.	Structural instability of the practice
*See link to example of		• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent re
underground storage		infrastructure may result
settling figure <u>here</u>		Maintenance is needed "before the next rainy season" for:
(provided by the		Partially clogged inlet or overflow
		 Misaligned inlet or overflow structures that have resulted in some erosion

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Minnesota Stormwater		Significant sediment deposition (capacity testing for scheduling)
Manual).		Litter, large debris, and solid waste
		 Sediment deposition downstream of the practice
		Erosion downstream of the practice
		Leaks, Leaking pipes, or manholes
		 Significant cracks, joint failures, corrosion
		Maintenance is needed "within a year or two" for:
		 Misaligned inlet/outlet structures that have not resulted in erosion
		 Some sediment deposition (capacity testing for scheduling)
Manhole/Catch Basin	The sump collects sediment, litter and other debris	DO NOT ENTER underground structures/confined spaces unless you are a trained professional.
with sump	before the water flows into the connected drainage	Immediate Attention is needed for:
	system.	• If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present,
*See link to example of		 If observe pose a hazard to the public or environment, call the city at 218 730 4100.
Manhole with sump	A manhole or catch basin with sump serves two	Maintenance is needed "before the next rainfall" for:
Plan & Cross section	purposes: draining surface water and filtering out	 Completely clogged inlet or overflow
<u>here</u> (provided by the	solids.	 Structural instability of the practice
Minnesota Stormwater		• Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent r
Manual).	RUNOFF	infrastructure may result
	INFLOW THROUGH GRATE	Maintenance is needed "before the next rainy season" for:
	clean debris from gate	Partially clogged inlet or overflow
		 Misaligned inlet or overflow structures that have resulted in some erosion
	replace broken or missing elbow	 Significant sediment deposition (capacity testing for scheduling)
	INFLOW	• Litter, large debris, and solid waste
	INFLOW	 Sediment deposition downstream of the practice
	CLEANER	Erosion downstream of the practice
	UNDERFLOW	• Leaks, Leaking pipes, or manholes
	1/2	 Significant cracks, joint failures, corrosion
	clean when }	Maintenance is needed "within a year or two" for:
	solids reach	 Misaligned inlet/outlet structures that have not resulted in erosion
	volume	 Some sediment deposition (capacity testing for scheduling)

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