BMP Type	Description/Function	Timeline for Required Maintenance
Filtration Practice (Dry Swale, Wet Swale, Filtration Basin, etc.) *See link to example of Surface Sand Filer Plan & Profile here (provided by the Minnesota Stormwater Manual).	Filtration practices are the process of removing suspended solids from the stormwater by passing the water through a bed of porous media consisting of sand or soil. In filtration, the solids that are removed from the water are retained by the filter media. Summary: Filtration is the process of water passing through a porous medium to remove particles to remove pollutants and rate control.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Standing water more than 48 hours after runoff has entered the practice (determine the cause) • Significant erosion on the banks or within the basin • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **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 Basin/Trench) *See link to example of Infiltration Basin Plan & Profile here (provided by the Minnesota Stormwater Manual).	Infiltration practices operate by capturing and temporarily storing stormwater, before allowing it to infiltrate into the underlying native soil. The infiltrated water is then partitioned into groundwater recharge, discharge through an underdrain (if applicable), and transpiration. By performing this process, these practices provide two fundamental functions in stormwater management: attenuation of runoff volume and treatment of the runoff. These functions may ultimately reduce stormwater pollutants, increase groundwater recharge, decrease runoff peak flow rates, and decrease the volume of stormwater runoff. Summary: Infiltration is the process of water soaking into the ground. Infiltration helps recharge groundwater and reduce runoff volume. * Infiltration practices are uncommon in Duluth due to clay soil but can be found in Park Point.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Standing water more than 48 hours after runoff has entered the practice (determine the cause) • Significant erosion on the banks or within the basin • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **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 • Vegetation coverage less than 50% of the design coverage • 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)

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Wet Pond (also known as Stormwater Pond, Wet Retention Pond, Wet Extended Detention Pond) *See link to example of Typical Wet Pond Plan & Profile here (provided by the Minnesota Stormwater Manual).	Are basins that have a permanent pool of water (or throughout the wet season). The primary pollutant removal mechanisms are sediment settling and pollutant uptake, particularly of nutrients, through biological activity in the pond.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Significant erosion on the banks or within the basin • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **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 (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 as Dry Detention Pond, Extended Detention Basin, Detention Pond and Extended Detention Pond) *See link to example of Detention Shallow Wetland Plan & Profile here (provided by the Minnesota Stormwater Manual).	Are basins that detain stormwater for some minimum time (e.g., 24 hours) to allow particles and pollutants to settle and reduce peak flow rates. They do not have large permanent pools of water—unlike wet ponds, though they often have small pools at the inlet and outlet of the basin.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Standing water more than 48 hours after runoff has entered the practice (determine the cause) • Significant erosion on the banks or within the basin • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **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 (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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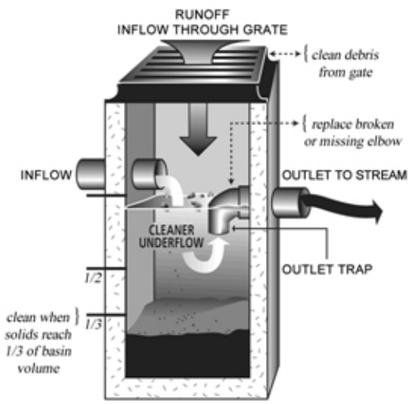
Permeable Pavement/Pavers	A pavement/paver system that allows the movement of stormwater through the pavement surface and into a base/subbase reservoir. Examples include pervious concrete, porous asphalt and permeable pavers/blocks.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **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 (Rain Garden) *See link to example of Bioinfiltration with no underdrain figure here (provided by the Minnesota Stormwater Manual). *See link to example of Biofiltration with underdrain at bottom figure here (provided by the Minnesota Stormwater Manual).	Bioretention practices, such as rain gardens, are landscape depressions that treat on-site stormwater discharged from impervious surfaces such as roofs, driveways, sidewalks, parking lots and compacted lawns. They are used to collect stormwater and filter it through a mixture of soil, sand and/or gravel. The designs of bioretention practice mimic volume reduction and pollutant removal mechanisms that work in natural systems. The filtered stormwater soaks into the ground, provides water to plants and can help recharge the local groundwater supply. Through these processes, bioretention practices reduce peak flows within downstream sewer systems and allow pollutant removal through filtration and plant uptake.	**Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Standing water more than 48 hours after runoff has entered the practice (determine the cause) • Significant erosion on the banks or within the basin • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **Maintenance is needed "before the next rainy season" for:** • Partially clogged inlet or overflow • Misaligned inlet or overflow structures that have resulted in some erosion • Vegetation coverage less than 50% of the design coverage • 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)
Underground Sedimentation Device (Underground Sand Filter, Chamber, Sediment Control Structure, etc.) *See link to example of underground storage settling figure here (provided by the	Sedimentation is the process by which solids are removed from the water column by settling. Sedimentation practices typically consist of engineered underground vessels that decrease the flow velocity and/or the mixing and provide temporary storage of stormwater runoff to allow suspended solids to settle and be retained by the stormwater treatment practice.	**DO NOT ENTER** underground structures/confined spaces unless you are a trained professional. **Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Structural instability of the practice • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **Maintenance is needed "before the next rainy season" for:** • Partially clogged inlet or overflow • Misaligned inlet or overflow structures that have resulted in some erosion

Minnesota Stormwater 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 • 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 with sump *See link to example of Manhole with sump Plan & Cross section here (provided by the Minnesota Stormwater Manual).	The sump collects sediment, litter and other debris before the water flows into the connected drainage system. A manhole or catch basin with sump serves two purposes: draining surface water and filtering out solids.  	**DO NOT ENTER** underground structures/confined spaces unless you are a trained professional. **Immediate Attention is needed for:** • If any evidence of illicit discharge, smell of gasoline, oil, paint or/and any unusual smells are present, call the city at 218 730 4100. • If observe pose a hazard to the public or environment, call the city at 218 730 4100. **Maintenance is needed "before the next rainfall" for:** • Completely clogged inlet or overflow • Structural instability of the practice • Damaged/misaligned/askew inlet or overflow such that flooding or structural instability of adjacent roadways or infrastructure may result **Maintenance is needed "before the next rainy season" for:** • Partially clogged inlet or overflow • 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 • 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)