**POLLUTION PREVENTION AND GOOD HOUSEKEEPING PLAN**

**(O&M PLAN)**

**PURPOSE**

To comply with Phase 1 Municipal Storm Water Permit # WAR-04-4201, section S6, D6, a by:

1. Developing and implementing an O & M Plan to minimize stormwater pollution from activities conducted at TCC for stormwater system maintenance, road and parking lot maintenance, vehicle fleet maintenance, external building maintenance, grounds maintenance, and material and equipment storage areas.
2. TCC has no industrial activities, so the requirement for General NPDES Permits for Stormwater Discharges Associated with Industrial Activities does not apply.

**APPLICABLE OPERATIONS**

The O&M Plan covers the following operations:

1. Good Housekeeping procedures and routine and preventative maintenance of the stormwater system at TCC.
2. Road and parking lot maintenance practices, including: deicing, snow removal, sanding, paving or patching asphalt or concrete work.
3. Vehicle fleet maintenance, including: mechanical repairs, fueling, and washing.
4. External building maintenance, including: exterior cleaning, washing, painting, and other maintenance activities.
5. Materials storage, including: stockpiling of gravel or other debris and heavy equipment storage.
6. Grounds maintenance, including: fertilizer, pesticide, and herbicide application, waste disposal, demolition debris, sediment and erosion control.

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**Standard General Operating Procedures**

1. Familiarize yourself with the location of all storm drains and conveyance facilities in all work areas.
2. Protect stormwater facilities during all work to ensure that only rain water enters the drainage system.
3. Do not dump liquids or other materials outside.
4. Pick up trash and dispose in dumpster.
5. Keep trash receptacles closed at all times.
6. Do not put liquids in trash receptacles.
7. Do not put hazardous materials in trash receptacles.
8. Keep outside work areas clean and sweep up after projects.
9. Do not hose down outside work areas.
10. Promptly clean up and contain all solid or liquid pollutant spills. Use solid absorbents and pads for clean-up of liquid spills and leaks.
11. Promptly repair or replace leaking connections, pipes, valves, hoses, or other leaking equipment that could contaminate stormwater
12. Place debris resulting from storm system maintenance in the compactor. If the debris is hazardous material then follow the appropriate hazmat procedure.
13. TCC will keep documentation to demonstrate compliance with the O&M Plan in the form of Work Orders, Spill log, Oil/Water Separator log.
14. Wash TCC owned vehicles at the building 21 wash pad only, the vehicles must fit within the pad area.
15. When fueling equipment, follow all instructions indicated in the Spill Prevention and Emergency Cleanup section of this O&M plan.
16. Conduct spot checks of stormwater treatment and flow control facilities following a 24 hour storm event with a 10 year or greater recurrence interval. Record the inspection details on a work order.
17. Inspect the storm system per the storm system inspection requirements during the following intervals; monthly from NOVEMBER through APRIL and annually, once in Late Summer, preferably September and after every Major Storm, use 1 inch in 24 hours as a Guideline.

**Integrated Pest Management**

1. Grounds maintenance staff use Integrated Pest Management practices on all the college grounds. The use of pesticides is already limited to spot applications as needed. They also replaced some areas with low maintenance landscaping which minimize the use of irrigation water and pesticides and at the same to increase surface water retention and filtering. Irrigation is conducted sparingly, with some lawns allowed to “go brown” in summer.

 **General Pest Management**

1. Always follow the manufacturer’s recommendations for mixing, application, and disposal.
2. Use manual or mechanical methods for weed control whenever possible.
3. When chemicals are used use the least toxic and most biodegradable product possible.

**Pesticide Mixing**

1. Mix fertilizers, herbicides, and pesticides inside a protected area with impervious secondary containment so that spills and leaks will not contact soil or enter the storm water system.
2. Label all containers.
3. Only mix the minimum amount of product that will be needed for the immediate job.
4. If possible, use rinse water from cleaning of containers and application equipment as a dilution for the next batch.

**Pesticide Application**

1. Follow application guidance on the product label.
2. Time the application to coincide with manufacturer’s recommendation for best results.
3. Do not spray if rain is expected.
4. Limit use of pesticides in general and do not broadcast spray pesticides.
5. Spot spray herbicides whenever possible.
6. Use herbicide only when there is vegetation to manage (do not use preventatively or more often than required).
7. Fertilizers may be broadcast sprayed, with care taken to avoid waterways or any inlet to the storm drain system.
8. Use granular materials when possible to avoid application losses.
9. Do not apply fertilizers, herbicide, or pesticides within 100 feet of any open water, drainage ditch, wetland, storm water basin or inlet to the storm drain system.
10. See Manager of Planning & Environmental Services to obtain an NPDES permit before spraying any herbicide in wetland mitigation areas for weed control.

**Pesticide Cleanup**

1. Follow all manufacturers’ recommendations for cleanup of the chemical.
2. Sweep paved areas where any granular product has fallen and direct product into grassy areas.
3. Cleanup any spills of product quickly using the methods described in SOP: Incidental Spill Response & Cleanup.
4. Dispose of excess chemicals and empty expired fertilizer, herbicide or pesticide containers according to the instructions on the label and preferably on the target vegetation or pest.
5. If possible reuse the triple rinsate from containers as dilution for the next batch.
6. Never dispose of rinsate by pouring into the storm drain system.
7. Any product that cannot be disposed of through application on the target vegetation or pest must be disposed of as Hazardous Waste.

**Pesticide Storage**

1. Store fertilizers, herbicides, and pesticides inside a protected area with impervious secondary containment so that spills or leaks will not enter soils or the storm drain system.
2. All containers must be clearly and accurately labeled.

**Pesticide Hazardous Waste Disposal**

1. Hazardous wastes should be labeled as such and may include cleaning products, paints, fertilizers, herbicides, and pesticides, oil, fuels, acids, poisons, antifreeze, brake fluid, solvents, etc.

**De-icing, anti-icing, snow removal**

1. Snow Plowing
	1. Avoid plowing, pushing, blowing or storing excess snow or other debris into storm drains.
	2. Do not dispose of snow in wetlands, ditches, open water, or directly on top of storm drains.
	3. Establish snow storage area that are:
		1. On a grass or gravel surface where melt water can infiltrate.
		2. Down gradient from water courses or wetlands.
		3. Not located on or near storm drains.
	4. Cleanup and sweep sediment and debris from paved surfaces after snowmelt.
2. Sanding
	1. Use only clean sand for winter road maintenance.
	2. Do not use salt or chemical deicer on Port roads or parking lots.
	3. Use the lowest application rate that will be effective.
	4. Sweep roads and parking lots after winter sanding operations.
3. Sand Loading and Storage
	1. Stockpiled sand should be stored under cover or covered with a tarp.
	2. When loading sand, care should be taken not to overload the truck.
	3. Loading areas and yards should be swept frequently to prevent sand build up and runoff.
4. Salt/Deicer Application
	1. Hand apply salt and/or chemical deicers only on sidewalks where required for pedestrian safety.
	2. Use the lowest amount of product that will be effective.
	3. Do not apply salt and/or chemical deicers near storm drains.

**Building or Structure Painting, Scraping, Sanding, and Sandblasting**

1. Use a ground cloth securely attached to the base on the building for any scraping or sanding of the exterior surface.
2. Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes.
3. Enclose spray-painting operations with tarps or other means, as possible, to minimize wind drift and to contain overspray.
4. Clean paintbrushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains.
5. Brushes and tools used for oil-based paints, finishes, thinners, solvents or other materials must be cleaned over a tub or container and the cleaning wastes disposed or recycled at an approved hazardous waste facility.
6. Never clean tools over a storm drain or outside.
7. Promptly cleanup any spills of paints, cleaners or other maintenance chemicals or supplies.
8. When sand blasting exterior surfaces, place tarps or ground cloths beneath the work area to capture sand blasting media and debris. Enclose the sand blasting area with tarps or plastic to protect from wind and to capture airborne particles (dust).
9. Cease all sand blasting operations on windy days.

**Pressure Washing & Exterior Surface Cleaning**

1. Prior to pressure washing, identify where all storm drains are located; wash water must not be allowed to flow down gutters or enter storm drains.
2. Block or cover all storm drains with booms and weighted storm drain covers before pressure washing.
3. Determine where water will pool for collection. Use a wet vac to vacuum up the wastewater or allow water to evaporate.
4. Use dry cleanup methods, including sweeping, vacuuming, and scrapping off dried debris prior to pressure washing any surface.
5. Pressure wash with minimal water.
6. If you are not using any chemicals or detergents, the wash water can be directed to a grassy or gravel area where it can infiltrate. Verify that water is not running out of the area and encountering a paved surface.
7. If any additives are used in the wash water, the waste water must be captured for disposal to sanitary sewer.
8. Solids should be removed from the area prior to pressure washing and a filter bag or similar filtration device should be used to remove suspended solids from the wastewater.
9. A visible sheen must not be evident in the discharge. Use an absorbent pad or boom to eliminate any oil from the discharge.
10. Do not pressure wash an entire building. Spot clean, steam clean, or scrape dirty areas rather than pressure washing the entire structure.
11. Pressure washing of buildings and structures is allowed only when moss, graffiti, and unusual material buildup must be removed. All water from pressure washing and cleaning of related equipment, shall not be allowed to go into the storm sewer and shall be collected and disposed of to sanitary sewer.

**Outdoor Storage Areas**

1. If possible, store all containers indoors whenever possible. If they must be stored outdoors, place them in a shed or under a roof.
2. All containers and dry materials should be covered or have secondary containment.
3. Place all containers on a plastic pallet or other device that elevates them off the ground or pavement and provides containment. This avoids contact with storm water on the ground.
4. Place containers on paved, impervious surfaces and as far from (or at lower elevation than) storm drain inlets and drainage ditches as possible.
5. Keep a spill kit near storage areas. Clean up any spills, leaks or discharges promptly.
6. Inspect all containers stored outdoors regularly.
7. If a container is found to be leaking either empty the contents into a leak-tight container or place entire leaking container inside of a larger leak-tight container. Clean up spills promptly.
8. If rain water collects in a secondary containment structure, allow the water to evaporate if possible. If not possible, verify with sight & smell that the water is not contaminated with a hazardous substance and then pump to sanitary sewer for disposal.
9. If water is suspected of containing hazardous waste (oil sheen, odor), the water must be treated as hazardous waste and be disposed of properly.
10. Call Ventilation Power Cleaning (VPC) 206-391-6636, 206-634-2750 or Certified Cleaning Services, Inc. (CCS) 253-377-5590, 253-536-5500, 1-800-290-3008 to have contaminated liquid removed with a vacuum truck.

**Sand, Salt, Dirt, Bark or Gravel Stockpiles**

1. Cover sand/salt stock piles with a tarp or store inside a building or under a roof.
2. Stock pile Sand, Salt, Dirt, Bark or Gravel in a location so that fines will not run out from the pile and into the storm sewer and contain stormwater runoff from dirt, bark and gravel stockpiles by using barriers or berms.

**Construction & Demolition Materials**

1. Stockpile only materials that have value and a high likelihood of being reused on projects.
2. Locate stockpiled materials far from storm drains and cover any materials that could erode or leach in stormwater.
3. Treated timber, sand/gravel, and asphalt debris must be stored under cover or tarps with provisions to avoid contact with surface runoff (placed on tarp/pallet or berm).
4. Chipped or ground wood products must be stored under cover where they will not be mobilized by stormwater.
5. Dispose of all other building demolition, land clearing, pavement maintenance, or other construction debris immediately after completing the project.

**Spill Prevention and Emergency Cleanup**

1. Store all chemical liquids, fluids, and petroleum products, on an impervious surface that is surrounded with a containment, berm or dike that is capable of containing 110% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater and prevent precipitation from accumulating in containment areas with a roof or equivalent structure.
2. Locate spill kits within 25 feet of all stationary fueling stations, fuel transfer stations, and mobile fueling units. At a minimum, spill kits shall include:
	1. Oil absorbents capable of absorbing 15 gallons of fuel.
	2. A storm drain plug or cover kit.
	3. A non-water containment boom, a minimum of 10 feet in length with a 12 gallon absorbent capacity.
	4. A non-metallic shovel.
	5. Two five-gallon buckets with lids.
3. Do not “top off” tanks being refueled.
4. Block, plug or cover storm drains that receive runoff from areas where fueling, during fueling.
5. Use drip pans or equivalent containment measures during all petroleum transfer operations.
6. Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas).
7. Use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible.
8. Drain fluids from equipment and vehicles prior to on-site storage or disposal.
9. Maintain a spill log that includes the following information for chemical and petroleum spills: date, time, amount, location, type of material spilled and reason for spill; date/time clean-up completed, notifications made and staff involved.

**STORM INSPECTION REQUIREMENTS**

**THE FOLLOWING PAGES INDICATE THE SYSTEM AND REQUIREMENTS FOR EACH.**

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| **DETENTION TANKS** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| Storage Area | plugged Air Vents | One-Half of the cross section of a vent is blocked at any point or the vent is damaged | Vents open and Functioning |
| Debris and sediment | Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 the length of storage vault or at any point sediment depth exceeds 15% of the diameter.Example: 72 inch storage tank would require cleaning when sediment reaches depth of 7 inches or more for more than 1/2 the length of the tank | all sediment and debris removed from storage area |
| Joints between Tank / Pipe Section | Any openings or voids allowing material to be transported into the facility.(will require engineering analysis to determine structural stability) | ALL Joints between Tank / Pipe Section are sealed |
| Tank Pipe Bent out of shape | Any part of Tank / Pipe bent out of shape more than 10% if its design shape.(Review required by engineer to determine structural stability) | Tank / Pipe repaired or replaced to design |
| Vault Structure, Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab | Cracks wider than 1/2" and any evidence of soil particles entering the structure through the cracks, or maintenance / inspection personnel determines that the Vault is not structurally soundCracks wider than 1/2" at the joint of any inlet / outlet pipe or any evidence of soil particles entering through the vault walls | Vault replaced or repaired to design specifications and is structurally sound.NO Cracks more than 1/4" wide at the inlet / outlet pipe |
| Manhole | Cover not in place | Cover is missing or partially in place.Any open manhole requires maintenance. | Manhole is closed |
| Locking Mechanism not working | Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2" of thread.(may not apply to self-locking lids) | Mechanism opens with proper tools |
| Cover Difficult to remove | One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance. | Cover can be removed and reinstalled by one person |
| Ladder rungs unsafe | Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust or cracks. | Ladder meets design standards. Allows maintenance person safe access. |
| Catch basins | See "Catch Basins" | See "Catch Basins" | See "Catch Basins" |

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| **CATCH BASINS** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| General | Trash & Debris | Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10% | No trash or debris located immediately in front of catch basin or on grate opening |
| Trash or debris in the basin that exceeds 60% of the sump depth as measured from the bottom of the basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6" clearance from the debris to the invert of the lowest pipe | No trash or debris in catch basin  |
| Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height | Inlet and outlet pipes free of trash or debris |
| Dead animals or Vegetation that could generate odors that could cause complaints or dangerous gasses (e.g. methane) | No dead animals or vegetation present within catch basins |
| Sediment | Sediment in the basin that exceeds 60% of the sump depth as measured from the bottom of the basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6" clearance from the debris to the invert of the lowest pipe | No Sediment in catch basin  |
| Structure Damage to Frame and/or Top Slab | The slab has holes larger than 2 square inches or cracks wider than 1/4" (intent is to make sure no material is running into basin) | Top slab is free of holes and cracks |
| Frame not sitting flush on top slab, i.e. separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached | Frame is sitting flush on the riser or top slab and firmly attached |
| Fractures or Cracks in Basin Walls / Bottom | Maintenance person judges that structure is unsound | Basin replaced or repaired to design standards |
| Grout fillet has separated or cracked wider than 1/2" and longer than 1 foot at the joint of any inlet / outlet pipe or any evidence of soil particles entering catch basin through cracks | Pipe is regrouted and secure at basin wall |
| Settlement / Misalignment | If failure of basin has created a safety, function or design problem | Basin replaced or repaired to design standards |
| Vegetation | Vegetation growing across and blocking more than 10% of the basin opening | No Vegetation blocking opening to basin |
| Vegetation growing in inlet / outlet pipe joints that are more than 6" tall and less than 6" apart | No Vegetation blocking opening to basin |
| Contamination and Pollution | Any evidence of Oil, Gasoline, contaminants or other pollutants(coordinate removal / cleanup with local water quality response agency) | No Pollution present |
| Catch Basin Cover | Cover not in place | Cover is missing or partially in place.Any open catch basin requires maintenance | Catch basin cover is closed |
| Locking mechanism not working | Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2" of thread. | Mechanism opens with proper tools |
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| **CATCH BASINS - cont.** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| Catch Basin Cover | Cover Difficult to remove | One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance. | Cover can be removed and reinstalled by one person |
| Ladder | Ladder rungs unsafe | Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust or cracks. | Ladder meets design standards. Allows maintenance person safe access. |
| Metal Grates(if applicable) | Grate opening unsafe | Grate opening wider than 7/8" | Grate opening meets design standards |
| Trash and Debris | Trash and debris that is blocking more than 20% of grate surface in letting capacity | Grate free of trash and debris |
| Damaged or missing | Grate missing or broken member(s) of the grate | Grate is in place and meets design standards |
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| **CATCH BASIN INSERTS** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| General | Sediment Accumulation | When sediment forms a cap over the insert media of the insert and / or unit | No sediment cap on the insert media and it's unit |
| Trash and Debris Accumulation | Trash and Debris Accumulates on insert unit creating a blockage / restriction | Trash and debris removed from insert unit runoff freely flows into catch basin |
| Media insert not removing oil | Effluent water from media insert has a visible sheen | Effluent water from media insert is free of oils and has no visible sheen |
| Media insert Water Saturated | Catch basin insert is saturated with water and no longer has the capacity to absorb | Remove and replace the media insert |
| Media insert Oil Saturated | Media saturated due to petroleum spill that drains into catch basin | Remove and replace the media insert |
| Media insert use beyond normal product life | Media has been used beyond the typical average life of media insert product | Remove and replace the media at regular intervals, depending on insert product |
| **Bioswales** |  |  |
| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| Bioswales | Sediment Accumulation on grass | Sediment Depth exceeds 2" | Remove sediment deposits on grass treatment area of the bioswale. When finished, Bioswale should be level from side to side and drain freely toward outlet. There should be no areas of standing water once inflow has ceased |
| Standing Water | When water stands in the swale between storms and does not drain freely | Any of the following may apply:remove sediment or trash blockages, improve grade from head to foot of swale, remove clogged check dams, add under drains or convert to a wet biofiltration swale |
| Flow spreader | Flow Spreader uneven or clogged so that flows are not uniformly distributed through the entire swale width | Level the spreader and clean so that flows are spread evenly over the entire swale width |
| Constant Base flow | When small quantities of water flow through the swale, even when it has been dry for weeks, and an eroded, muddy channel has formed in the swale bottom | Add low-flow pea gravel drain the length of the swale or bypass the base flow around the swale |
| Poor Vegetation Coverage | When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom. | Determine why grass growth is poor and correct condition. Re-plant using plugs of grass from the upper slope: plant in the swale bottom at 8" intervals. Or reseed into loosened soil |
| Vegetation | when grass becomes excessively tall (Greater than 10")When nuisance weeds and other vegetation starts to take over | Mow vegetation or remove nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches. Remove Grass Clippings |
| Excessive shading | Grass Growth is poor because sunlight does not reach swale | If possible, trim back overhanging limbs and remove brushy vegetation on adjacent slopes |
| Inlet / Outlet | Inlet / Outlet areas clogged with sediment and / or debris | Remove material so that there is no clogging or blockage in the inlet and outlet area |

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| **Bioswales - cont.** |  |  |
| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| Bioswales | Trash and debris accumulation | Trash and debris accumulated in the bioswale | Remove Trash and debris from the bioswale |
| General | Erosion / Scouring | Eroded or Scoured swale bottom due to flow channelization, or higher flows | For ruts or bare areas less than 12 inches wide, repair damaged area by filling with Crushed Gravel.If bare areas are large - generally larger than 12 inches wide - the swale should be regraded and reseeded.For smaller bare areas, overseed when bare spots are evident Re-plant using plugs of grass from the upper slope: plant in the swale bottom at 8" intervals. |

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| **PONDS** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| GENERAL | Trash and Debris buildup in pond | Dumping of yard wastes such as grass clippings and branches into basin.Unsightly accumulation of nondegradeable materials such as glass, plastic, metal, foam and coated paper | Remove trash and debris and dispose as prescribed by the County |
| Trash rack plugged or missing | Bar Screen over outlet more than 25% covered by debris or missing | Replace screen.Remove trash and debris and dispose as prescribed by the County |
| Poisonous Vegetation | Any poisonous vegetation which may constitute a hazard to the public. Examples of poisonous vegetation include: tansy, ragwort, poison oak, stinging nettles, devils club | Remove poisonous vegetation.Do not spray chemicals on vegetation without obtaining guidance from the Cooperative Extension Service and approval from the County |
| Fire hazard or pollution | Presence of chemicals such as Natural Gas, Oil and gasoline, Obnoxious color, odor or sludge noted. | Find sources of pollution and eliminate them.Water is free from noticeable color, odor and contamination. |
| Vegetation is not growing or is overgrown | For grassy ponds, grass cover is sparse and weedy or overgrown.For wetland ponds, plants are sparse or invasive species are present. | For grassy ponds, selectively thatch, aerate and reseed ponds. Grass cutting unnecessary unless dictated by aesthetics. For wetland ponds, hand-plant nursery-grown wetland plants in bare areas. Contact the Cooperative Extension Service for direction on invasive species such as purple loosestrife and reed canary grass. Pond bottoms should have uniform color and coverage of desired plant species. |
| Rodent Holes | 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 destroyed and dam or berm repaired.Contact the Tacoma-Pierce county department of health for direction. |

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| **PONDS cont.** |  |  |
| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| General | Insects | When insects such as wasps and hornets interfere with maintenance activities, or when mosquitoes become a nuisance. | Insects destroyed or removed from the site Contact the Cooperative Extension Service for guidance. |
| Tree Growth | Tree growth does not allow maintenance access or interferes with maintenance activity (e.g. slope mowing, silt removal or equipment movements).If trees are not interfering with access, leave trees alone. | Trees do not hinder maintenance activities.Selectively cultivate trees such as alders for firewood. |
| Side slopes of pond | Erosions on berms or at entrance or exit | Check around inlets and outlets for sign of erosion.Check berms for signs of sliding or settling.Action is needed where eroded damage over 2" deep and where is potential for continued erosion. | Find causes of erosion and eliminate them. Then slopes should be stabilized by using appropriate erosion control measure(s); e.g. rock reinforcement, planting of grass, compaction. |
| Storage area | Sediment buildup in pond | Accumulated sediment that exceeds 10% of the designed pond depth.Buried or partially buried outlet structure probably indicates significant sediment deposits. | Sediment cleaned out to desired pond shape and depth; pond reseeded if necessary to control erosion. |
| Pond Dikes | Settlements | Any part of a dyke which has settled 4" lower than the design elevation. | Dyke should be built back to the design elevation |
| Emergency overflow / spillway | Rock missing | Only one layer of rock exists above native soil in area 5 square feet or larger, or any exposure of native soil | Replace rock to design standards |
| Emergency overflow / spillway | Overflow missing | Side of pond has no area with large rocks to handle emergency overflows | Contact the County for Guidance. |

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| **STORM FILTER VAULT** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| Media Filter Vault | Sediment Accumulation on top of Filter Cartridges | Sediment Accumulation exceeds 1/4" on top of cartridges | No sediment deposits on top of cartridges.Sediment on cartridges likely indicates that cartridges are plugged and require maintenance |
| Sediment Accumulation in Vault | Sediment Accumulation in Vault exceeds 2".Look for other indicators of clogged cartridges or overflow | Sediment in vault shall be removed.Cartridges should be checked and replaced or serviced as needed. |
| Trash and Floatable Debris accumulation in vault | Trash and Floatable Debris accumulation | NO Trash and Floatable Debris in filter vault |
| Filter Cartridges Submerged | Filter Vault does not drain within 24 hours following storm.Look for evidence of submergence due to backwater or excessive hydrocarbon loading. | Filter media checked and replaced if needed.If cartridges are plugged with oil, additional treatment or source control BMP may be needed |
| Forebay | Sediment Accumulation | Sediment Accumulation exceeds 6" or 1/3 of available sump | Sediment Accumulation less than 6" |
| Below Ground Vault | Access cover Damaged / missing | One Maintenance person cannot remove lid after applying 80 pounds of lift, corrosion or deformation of cover | Cover repaired to proper working specifications or replaced |
| Damaged Pipes | Any part of the pipes are crushed or damaged due to corrosion and / or settlement | Pipe repaired or replaced |
| Vault structure has cracks in wall, bottom and damage to frame and / or top slab | cracks wider than 1/2" or evidence of soil particles entering the structure through the cracks, or maintenance / inspection personnel determine that the vault is not structurally sound | Vault repaired or replaced so that vault meets design specifications and is structurally sound |
| Vault structure has cracks in wall, bottom and damage to frame and / or top slab | cracks wider than 1/2" at the joint of any inlet / outlet pipe or evidence of soil particles entering through the cracks | Vault repaired so that no cracks exist wider than 1/4" at the joint of inlet / outlet pipe |
| Baffles | Baffles corroding, cracking, warping, and / or showing sign of failure as determined by maintenance / inspection person | Baffles repaired or replaced to design specifications |
| Ladder rungs unsafe | Maintenance person judges that ladder is unsafe due to missing rungs, misalignment, rust or cracks.Ladder must be fixed or secured immediately | Ladder meets design standards and allows maintenance persons safe access |

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| **DEBRIS BARRIERS (e.g. trash racks)** |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| General | Trash and Debris | Trash or debris that is plugging more than 20% of the openings in the barrier | Barrier cleared to design flow capacity |
| Metal | Damaged / Missing Bars | Bars bent out of shape more than 3" | Bars in place with bends no more than 3/4 " |
| Bars are missing or entire barrier missing | Bars in place according to design |
| Bars are loose and rust is causing 50% deterioration to any part of the barrier | Barrier replaced or repaired to design standards |
| Inlet / Outlet pipe | Debris barrier missing or not attached to pipe | Barrier firmly attached to pipe |

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|  **ENERGY DISSIPATERS** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| **EXTERNAL:** |  |  |  |
| Rock Pad | Missing or moved rock | Only one layer of rock exists above native soil in area 5 square feet or larger, or any exposure of native soil | Replace rock to design standards |
| Erosion | Soil erosion in or adjacent to rock pad | Rock pad replaced to design standards |
| Dispersion trench | Pipe plugged with sediment | Accumulated sediment that exceeds 20% of the design depth | Pipe cleaned / flushed so that it matches design |
| Not Discharging Water Properly | Visual evidence of water discharging at concentrated points along trench ( normal condition is a "sheet flow" of water along trench). Intent is to prevent erosion damage. | Trench redesigned or rebuilt to design standards. |
| Perforations Plugged | Over 1/2 of perforations in pipe are plugged with debris and sediment. | perforated pipe cleaned or replaced |
| Water flows out top of "distributor" Catch Basin | Maintenance person observes or receives credible report of water flowing out during any storm less than the design storm or its causing or appears likely to cause damage | Facility rebuilt or redesigned to standards |
| Receiving area Over - Saturated | Water in receiving area is causing or has potential of causing landslide problems | No danger of landslides |
| **MANHOLES** |  |  |
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| **MaintenanceComponent** | **Defect** | **Conditions When Maintenance is needed** | **Results Expected** |
| **INERNAL:** |  |  |  |
| Manhole / Chamber | Worn or Damaged Posts, Baffles, Side of Chamber | Structure dissipating flow deteriorates to 1/2 of original size or any concentrated worn spot exceeding one square foot which would make the structure unsound | Structure replaced to design standards |
| other defects | See Catch Basins | See Catch Basins |

# STORM SYSTEM INSPECTION FREQUENCY

**THE FOLLOWING PAGES INDICATE THE SYSTEM AND INSPECTION FREQUENCY FOR EACH.**

1. Conduct spot checks of stormwater treatment and flow control facilities following a 24 hour storm event with a 10 year or greater recurrence interval.
2. Record the inspection details on a work order.
3. Inspect the storm system per the storm system inspection requirements during the following intervals;
	1. monthly from NOVEMBER through APRIL and
	2. annually; Once in Late Summer, preferably September and
	3. after every Major Storm (use 1 inch in 24 hours as a Guideline).

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| STORM FILTER VAULT |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | Media Filter Vault | Sediment Accumulation on top of Filter Cartridges | Sediment Accumulation exceeds 1/4" on top of cartridges | No sediment deposits on top of cartridges.Sediment on cartridges likely indicates that cartridges are plugged and require maintenance |
| M | Sediment Accumulation in Vault | Sediment Accumulation in Vault exceeds 2".Look for other indicators of clogged cartridges or overflow | Sediment in vault shall be removed.Cartridges should be checked and replaced or serviced as needed. |
| M | Trash and Floatable Debris accumulation in vault | Trash and Floatable Debris accumulation | NO Trash and Floatable Debris in filter vault |
| S  | Filter Cartridges Submerged | Filter Vault does not drain within 24 hours following storm.Look for evidence of submergence due to backwater or excessive hydrocarbon loading. | Filter media checked and replaced if needed.If cartridges are plugged with oil, additional treatment or source control BMP may be needed |
| M | Forebay | Sediment Accumulation | Sediment Accumulation exceeds 6" or 1/3 of available sump | Sediment Accumulation less than 6" |
| A | Below Ground Vault | Access cover Damaged / missing | One Maintenance person cannot remove lid after applying 80 pounds of lift, corrosion or deformation of cover | Cover repaired to proper working specifications or replaced |
| A | Damaged Pipes | Any part of the pipes are crushed or damaged due to corrosion and / or settlement | Pipe repaired or replaced |
| A | Vault structure has cracks in wall, bottom and damage to frame and / or top slab | cracks wider than 1/2" or evidence of soil particles entering the structure through the cracks, or maintenance / inspection personnel determine that the vault is not structurally sound | Vault repaired or replaced so that vault meets design specifications and is structurally sound |
| A | Vault structure has cracks in wall, bottom and damage to frame and / or top slab | cracks wider than 1/2" at the joint of any inlet / outlet pipe or evidence of soil particles entering through the cracks | Vault repaired so that no cracks exist wider than 1/4" at the joint of inlet / outlet pipe |
| A | Baffles | Baffles corroding, cracking, warping, and / or showing sign of failure as determined by maintenance / inspection person | Baffles repaired or replaced to design specifications |
| A | Ladder rungs unsafe | Maintenance person judges that ladder is unsafe due to missing rungs, misalignment, rust or cracks.Ladder must be fixed or secured immediately | Ladder meets design standards and allows maintenance persons safe access |

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| PONDS |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M,S | GENERAL | Trash and Debris buildup in pond | Dumping of yard wastes such as grass clippings and branches into basin.Unsightly accumulation of nondegradeable materials such as glass, plastic, metal, foam and coated paper | Remove trash and debris and dispose as prescribed by the County |
| M,S | Trash rack plugged or missing | Bar Screen over outlet more than 25% covered by debris or missing | Replace screen.Remove trash and debris and dispose as prescribed by the County |
| M | Poisonous Vegetation | Any poisonous vegetation which may constitute a hazard to the public. Examples of poisonous vegetation include: tansy, ragwort, poison oak, stinging nettles, devils club | Remove poisonous vegetation.Do not spray chemicals on vegetation without obtaining guidance from the Cooperative Extension Service and approval from the County |
| M,S | Fire hazard or pollution | Presence of chemicals such as Natural Gas, Oil and gasoline, Obnoxious color, odor or sludge noted. | Find sources of pollution and eliminate them.Water is free from noticeable color, odor and contamination. |
| M | Vegetation is not growing or is overgrown | For grassy ponds, grass cover is sparse and weedy or overgrown.For wetland ponds, plants are sparse or invasive species are present. | For grassy ponds, selectively thatch, aerate and reseed ponds. Grass cutting unnecessary unless dictated by aesthetics. For wetland ponds, hand-plant nursery-grown wetland plants in bare areas. Contact the Cooperative Extension Service for direction on invasive species such as purple loosestrife and reed canary grass. Pond bottoms should have uniform color and coverage of desired plant species. |
| M | Rodent Holes | 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 destroyed and dam or berm repaired.Contact the Tacoma-Pierce county department of health for direction. |

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| PONDS cont. |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | General | Insects | When insects such as wasps and hornets interfere with maintenance activities, or when mosquitoes become a nuisance. | Insects destroyed or removed from the site Contact the Cooperative Extension Service for guidance. |
| A | Tree Growth | Tree growth does not allow maintenance access or interferes with maintenance activity (e.g. slope mowing, silt removal or equipment movements).If trees are not interfering with access, leave trees alone. | Trees do not hinder maintenance activities.Selectively cultivate trees such as alders for firewood. |
| M | Side slopes of pond | Erosions on berms or at entrance or exit | Check around inlets and outlets for sign of erosion.Check berms for signs of sliding or settling.Action is needed where eroded damage over 2" deep and where is potential for continued erosion. | Find causes of erosion and eliminate them. Then slopes should be stabilized by using appropriate erosion control measure(s); e.g. rock reinforcement, planting of grass, compaction. |
| M | Storage area | Sediment buildup in pond | Accumulated sediment that exceeds 10% of the designed pond depth.Buried or partially buried outlet structure probably indicates significant sediment deposits. | Sediment cleaned out to desired pond shape and depth; pond reseeded if necessary to control erosion. |
| A | Pond Dikes | Settlements | Any part of a dyke which has settled 4" lower than the design elevation. | Dyke should be built back to the design elevation |
| A | Emergency overflow / spillway | Rock missing | Only one layer of rock exists above native soil in area 5 square feet or larger, or any exposure of native soil | Replace rock to design standards |
| One Time | Emergency overflow / spillway | Overflow missing | Side of pond has no area with large rocks to handle emergency overflows | Contact the County for Guidance. |

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| CATCH BASINS and INLETS |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M,S | General | Trash, Debris and sediment in or on basin | Trash or debris which is located immediately in front of the catch basin opening is blocking inletting capacity of the basin by more than 10% | No Trash or debris located immediately in front of catch basin or on grate opening |
| M,S | Trash or debris in the basin that exceeds 60% of the sump depth as measured from the bottom of the basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6" clearance from the debris to the invert of the lowest pipe | No trash or debris in catch basin  |
| M,S | Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height | Inlet and outlet pipes free of trash or debris |
| M | Structure Damage to Frame and/or Top Slab | The slab has holes larger than 2 square inches or cracks wider than 1/4" (intent is to make sure no material is running into basin) | Top slab is free of holes and cracks |
| M | Frame not sitting flush on top slab, i.e. separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached | Frame is sitting flush on the riser or top slab and firmly attached |
| A | Fractures or Cracks in Basin Walls / Bottom | Maintenance person judges that structure is unsound | Basin replaced or repaired to design standards |
| A | Grout fillet has separated or cracked wider than 1/2" and longer than 1 foot at the joint of any inlet / outlet pipe or any evidence of soil particles entering catch basin through cracks | Pipe is regrouted and secure at basin wall |
| A | Settlement / Misalignment | If failure of basin has created a safety, function or design problem | Basin replaced or repaired to design standards |
| A | Vegetation | Vegetation growing across and blocking more than 10% of the basin opening | No Vegetation blocking opening to basin |
| A | Vegetation growing in inlet / outlet pipe joints that are more than 6" tall and less than 6" apart | No Vegetation blocking opening to basin |

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| CATCH BASINS and INLETS cont. |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M,S | General | Contamination and Pollution | Any evidence of Oil, Gasoline, contaminants or other pollutants(coordinate removal / cleanup with local water quality response agency) | No Pollution present |
| M,S | Catch Basin Cover | Cover not in place | Cover is missing or partially in place.Any open catch basin requires maintenance | Catch basin cover is closed |
| M,S | Locking mechanism not working | Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2" of thread. | Mechanism opens with proper tools |
| M,S | Cover Difficult to remove | One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance. | Cover can be removed and reinstalled by one person |
| M,S | Ladder | Ladder rungs unsafe | Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust or cracks. | Ladder meets design standards. Allows maintenance person safe access. |
| M,S | Metal Grates(if applicable) | Grate opening unsafe | Grate opening wider than 7/8" | Grate opening meets design standards |
| M,S | Trash and Debris | Trash and debris that is blocking more than 20% of grate surface inletting capacity | Grate free of trash and debris |
| M,S | Damaged or missing | Grate missing or broken member(s) of the grate | Grate is in place and meets design standards |

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| FENCING / SHRUBBERY SCREEN / OTHER LANDSCAPING |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | General | Missing or broken parts / dead shrubbery | Any defect in the fence or screen that permits easy entry into a facility | Fence is mended or shrubs replaced to form a solid barrier to entry |
| M,S | Erosion | Erosion has resulted in an opening under a fence that allows entry by people or pets | Replace soil under fence so that no opening exceeds 4" in height |
| M | Unruly vegetation | Shrubbery is growing out if control or is infected with weeds | Shrubbery is trimmed and weeded to provide appealing aesthetics. Do not use chemicals to control weeds. |
| A | Wire Fences | Damaged Parts | Posts out of plumb more than 6" | Posts plumb to within 1 1/2" of plumb |
| A | Top rails bent more than 6" | Top rails free of bends greater than 1" |
| A | Any part of fence (including posts, top rails and fabric) more than 1 foot out of design alignment | Fence is aligned and meets design standards |
| A | Missing or loose tension wire. | Tension wire in place and holding fabric. |
| A | Missing or loose barbed wire that is sagging more than 2 1/2" between posts | Barbed wire in place with less than 3/4" sag between posts |
| A | Extension arm missing, broken or bent out of shape more than 1 1/2" | Extension arm in place with no bends larger than 3/4" |
| A | Deteriorated paint or protective coating | Part of parts that have a rusting or scaling condition that has affected structural adequacy | Structurally adequate posts or parts with a uniform protective coating |
| M | Openings in Fabric | Openings in Fabric are such that an 8" diameter ball could fit through | No Openings in Fabric |

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| CONVEYANCE SYSTEMS - (Pipes, Ditches and Swales) |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | Pipes | Sediment and Debris | Accumulated sediment that exceeds 20% of the diameter of the pipe | Pipe cleaned of all sediment and debris |
| A | Vegetation | Vegetation that reduces free movement of water through pipe | All vegetation removed so water flows freely through pipes |
| M | Damaged (rusted, bent or crushed) | Protective coating is damaged, rust is causing more than 50% deterioration to any part of the pipe  | Pipe Repaired or replaced |
| M | Any dent that significantly impedes flow ( e.g. , decreases the cross section area of pipe by more than 20%) | Pipe Repaired or replaced |
| M | Pipe has major cracks or tears allowing groundwater leakage | Pipe Repaired or replaced |
| M,S | Open Ditches | Trash and Debris | Dumping of yard wastes such as grass clippings and branches into basin. Unsightly accumulation of non-degradable materials such as glass, plastic, metal, foam and coated paper | Remove trash and debris and dispose as prescribed by City Waste Management section. |
| M | Sediment Buildup | Accumulated sediment that exceeds 20% of the design depth | Ditch cleaned of all sediment and debris so that it matches design |
| A | Vegetation | Vegetation (e.g. , weedy shrubs or saplings) that reduces free movements of water through ditches | Water flows freely through ditches. Grassy vegetation should be left alone. |
| M | Erosion damage to slopes | See Ponds Checklist | See Ponds Checklist |
| A | Rock lining out of place or missing (if applicable) | Maintenance person can see native soil beneath the rock lining | Replace rocks to design standard |
| Varies | Catch Basins |   | See Catch Basins check list | See Catch Basins check list |
| M,S | Swales | Trash And Debris | See Above for Ditches | See Above for Ditches |
| M | Sediment Cleanup | See Above for Ditches | Vegetation may need to be replanted after cleaning |

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| CONVEYANCE SYSTEMS - (Pipes, Ditches and Swales) Cont. |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | Swales | Vegetation not growing or overgrown | Grass cover is sparse and weedy or areas are overgrown with woody vegetation | Aerate soils and reseed and mulch bare areas. Maintain grass height at a minimum of 6" for best stormwater treatment. Remove woody growth recontour and reseed as necessary |
| M,S | Erosion damage to slopes | See Ponds Checklist | See Ponds Checklist |
| M | Conversion by homeowner to incompatible use | Swale has been filled in or blocked by shed, woodpile, shrubbery, etc. | If possible speak to homeowner and request that swale area be restored. Contact City to report problem if not rectified voluntarily |
| A | Swale does not drain | Water stands in swale or flow velocity is very slow. Stagnation occurs. | A survey may be needed to check grades. Grades need to be in 1 - 5% range if possible. If grade is less than 1% under drains may need to be installed. |

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| GROUNDS (Landscaping) |
| **KEY:** | **M) MONTHLY from NOVEMBER through APRIL A) Once in Late Summer (preferably September)S) After and Major Storm (use 1 inch in 24 hours as a Guideline)** |
| **Frequency** | **Drainage System Feature** | **Problem** | **Conditions to Check For** | **Conditions that Should Exist** |
| M | General | Weeds (nonpoisonous) | Weeds growing in more than 20% of the landscaped area (trees and shrubs only) | Weeds present in less than 5% of the landscaped area |
| M | Safety Hazard | Any presence of poison ivy or other poisonous vegetation or insect nests | No poisonous vegetation or insect nests present in landscaped area |
| M,S | Trash or Litter | See Ponds checklist | See Ponds checklist |
| M,S | Erosion of Ground surface | noticeable rills are seen in landscaped areas | Causes of erosion are identified and steps are taken to slow down / spread out the water.Eroded areas are filled, contoured and seeded |
| A | Trees and Shrubs | Damage | Limbs or parts of trees or shrubs that are split or broken which affect more than 25% of the total foliage of the tree or shrub. | Trim trees / shrubs to restore shape. Replace trees / shrubs with severe damage |
| M | Trees or shrubs that have been blown down or knocked over | Replant, inspecting for injury to stem or roots. Replace if severely damaged. |
| A | Trees or shrubs that are not adequately supported or are leaning over, causing exposure of the roots. | Place stakes and rubber coated ties around young trees / shrubs for support |