2020 OPERATIONS & MAINTENANCE MANUAL

Port of Tacoma

July 2020

TABLE OF CONTENTS

INTRODUCTION

PURPOSE OF THIS MANUAL

This manual is intended to document how the Port of Tacoma is meeting all storm sewer systems operation and maintenance requirements under the Phase I Municipal Stormwater Permit, issued July 1, 2019, and effective from August 1, 2019 to July 31, 2024 (Permit, MS4 Permit). The MS4 Permit applies to Port of Tacoma (Port) operations, as well as properties owned and operated by the Port. The following sections describe the specific requirements of the Permit.

OPERATION AND MAINTENANCE PROGRAM

The Port's MS4 permit program must include an operation and maintenance (O&M) program for all stormwater treatment and flow control facilities and catch basins to ensure that BMPs continue to function properly.

Each of these facility types is required to have minimum performance measures that are as protective, or more protective than those specified in Appendix C of Volume 1 of the City of Tacoma July 2020 Stormwater Management Manual. For existing stormwater facilities which do not have maintenance standards, the Port must develop a maintenance standard.

The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding (not meeting) the maintenance standards between inspections and/or maintenance is not a permit violation. Where City requirements are more stringent than Permit requirements, the City standards will apply.

According to the Permit, the O&M Program, which this Manual documents, must meet the following minimum criteria (Special Condition S6.E.6):

The SWMP shall include an operation and maintenance program for all stormwater treatment and flow control BMPs/facilities and catch basins to ensure that BMPs continue to function properly.

Minimum Performance Measures:

A . Each Permittee shall implement an Operation and Maintenance (O&M) manual for all stormwater treatment and flow control BMPs/facilities and catch basins that are under the functional control of the Permittee and which discharge stormwater to its MS4, or to an interconnected MS4.

(i) Retain a copy of the O&M manual in the appropriate Permittee department(s) and routinely update following discovery or construction of new stormwater facilities.

(ii) The operation and maintenance manual shall establish facility-specific maintenance standards that are as protective, or more protective, than those specified in the Stormwater

Management Manual for Western Washington (current edition). For existing stormwater facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. Each Permittee shall update maintenance standards, as necessary, to meet the requirements of this section.

(iii) The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standards between inspections and/or maintenance is not a permit violation. Maintenance actions shall be performed within the time frames specified in S6.E.6.b.ii.

b. The Permittee will manage maintenance activities to inspect all stormwater facilities listed in the O&M manual annually and take appropriate maintenance action in accordance with the O&M manual.

(i) The Permittee may change the inspection frequency to less than annually, provided the maintenance standards are still met. Reducing the annual inspection frequency shall be based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

(ii) Unless there are circumstances beyond the Permittees control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed:

(1) Within 1 year for wet pool facilities and retention/detention ponds.

(2) Within 1 year for typical maintenance of facilities, except catch basins.

(3) Within 6 months for catch basins.

(4) Within 2 years for maintenance that requires capital construction of less than $25,000.

Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond their control.

c. The Permittee shall provide appropriate training for Permittee maintenance staff.

d. The Permittee will maintain records of inspections and maintenance activities.

This O&M Program applies to property under the Port's functional control where the Port is responsible for planning, staffing, and conducting operation and maintenance activities.

WHY MAINTAIN STORM SEWER FACILITIES?

Stormwater facilities are specific drainage features such as catch basins, oil/water separators, ditches, and biofiltration swales. Activities are maintenance activities associated with operating stormwater facilities such as vegetation management and small repair projects.

Along with keeping the site from flooding, properly maintained storm sewers can help reduce surface water and groundwater pollution. Storm sewer maintenance is necessary to ensure that facilities are functioning properly to protect streams, lakes, wetlands, and groundwater.

Proper maintenance helps assure that:

- Storm sewers operate as designed.
- Storm sewers are cleaned of the pollutants that they trap, such as sediment and oils, so that the storm sewers are not overwhelmed and become pollutant sources.
- Sources of pollutants to storm sewers (such as leaky dumpsters, vaults full of sediment) are remedied.

WHAT YOU SHOULD BE DOING?

This manual describes the steps the Port must take to ensure that the Port storm sewers, facilities and BMPs meet water quality requirements.

WHERE TO FIND MORE INFORMATION?

The following resources provide more information on storm sewer maintenance and water quality Best Management Practices (BMPs).

- City of Tacoma Surface Water Management Manual: https://cms.cityoftacoma.org/enviro/SurfaceWater/2016%20SWMM%20Manual/SWMM%20July%202016%20Masterbook.pdf
- WA Dept. of Ecology Western Washington Stormwater Management Manual: http://www.ecy.wa.gov/programs/wq/stormwater/tech.html
- WA Dept. of Transportation Highway Runoff Manual: https://www.wsdot.wa.gov/Publications/Manuals/M31-16.htm

For more information on the Port's O&M permit requirements, Environmental Compliance staff can be contacted below.

- Rob Zinkevich - rzinkevich@portoftacoma.com, 253-383-9451
- Anita Fichthorn - afichthorn@portoftacoma.com, 253-830-5379

METHOD FOR CREATING THIS MANUAL

This manual draws on other maintenance manuals to create a new manual for the Port of Tacoma. For the proprietary systems installed at the Port, their specific O&M Manuals are kept in the Facilities Maintenance Department. Along with documenting current state standards and

practices, this manual includes maintenance practices from the 2020 City of Tacoma Storm Water Management Manual.

MANUAL LAYOUT

The manual documents the framework to meet Phase I Permit requirements for the O&M Program. Maintenance standards and inspection checklists are included in this manual for guidance. Maintenance records are maintained in NPDES Pro and Maximo. This manual also includes general maintenance activities such as pesticide use and vegetation management.

For each type of stormwater facility or activity, this manual:

- Briefly describes the facility or activity.
- Includes detailed information on inspection, cleaning, and repairs, as well as safety, materials handling and vegetation management where appropriate.
- Includes maintenance standards.

Descriptions and maintenance information on proprietary devices, such as the Jellyfish Treatment systems and Up-Flo treatment systems are included in the Manufacturer Operation and Maintenance Manuals section which are stored and maintained at Facilities Maintenance.

MAINTENANCE GOALS

Maintenance of stormwater facilities is performed to meet desired goals. Maintenance goals are specified for each drainage feature or activity. They include both performance and appearance of the facility, and the need to prevent maintenance work itself from causing harm. Where applicable, these goals include:

- Minimize sediment and pollutant discharges from the work area;
- Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources;
- Minimize vegetation removal where feasible;
- Maintain or restore the intended infrastructure function;
- Prevent or reduce flooding;
- Meet public expectations for aesthetics;
- Preserve native plants; and
- Protect infrastructure.

SAFETY

Work inside "confined" spaces include, but are not limited to underground vaults, tanks, storage bins, manholes, pits, and pipelines. Confined spaces are classified as non-permit or permit-required when there is the potential to contain a hazardous atmosphere, engulf an entrant, other recognized safety/health hazards. Refer to Washington State Labor and Industries confined space WAC 296-809 and OSHA for which standards apply. Port Maintenance has all of the OSHA-required confined space entry equipment and staff have been trained on the equipment as well as the procedures.

MATERIALS HANDLING

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations, including the Minimum Functional Standards for Solid Waste Handling Chapter 173-304 WAC; guidelines for disposal of waste materials; and where appropriate, Dangerous Waste Regulations, Chapter 173-303 WAC.

Removed sediment must be properly disposed as solid waste. Water should be disposed of in a sanitary sewer, or at an approved facility. Oily water should be disposed of at an approved facility. Used oil absorbents should be recycled or disposed according the manufacturer's instructions.

TYPES OF STORMWATER FACILITIES

SPECIAL FACILITIES MAINTENANCE REQUIREMENTS

This manual provides a set of minimum standards and practices for maintaining stormwater facilities. Manufactured stormwater facilities such as Filterra biofiltration vaults, Storm Filter and oil/water separators often have maintenance requirements and manuals specified or written by the manufacturer. Also, larger or more complex stormwater facilities may include specifications for maintenance and vegetation management that provide specific detail beyond this manual.

MANUFACTURER OR DESIGNER'S MAINTENANCE MANUALS

Where the Maintenance and Environmental staff determines that other manuals or plans provide equal or greater level of maintenance and water quality protection, they should be followed.

ONE-OF-A-KIND FACILITIES

The Port may require development and implementation of a site-specific maintenance plan for complex or unusual facilities. The plan is required when the general provisions of this manual do not provide sufficient detail for inspection, maintenance, vegetation management, and repair practices to operate the facility.

CATCH BASINS & INLETS

Catch basins trap sediment and some oils that can pollute water bodies. They need to be inspected annually ~~and~~ cleaned when necessary to remove accumulated sediment, fluids, and trash. Figures 1 and 2 on the next pages show different types of catch basins.

Inspection

Inspect catch basins at least once per year. The City of Tacoma SWMM requires:

- Monthly from October - ~~April~~ and after any major storm event (1" in 24 hours).
- Annual inspections preferably before First Fall Flush.

Periodically inspect the catch basin and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Act to have the pollutant source removed.

Cleaning

Catch basins are required to be cleaned when they become 60 percent full. The Port recommends cleaning catch basins when they become one third full to maintain sediment-trapping capacity.

Catch basin and manhole cleaning should be performed in a way that keeps removed sediment and water from being discharged back into the storm sewer. A good time to clean them is at the end of the dry season. Clean putrid materials from catch basins when discovered or reported. Keep the inlet cleared of debris and litter.

Repairs

Repair any damage that prevents the catch basin from functioning as designed. An example is a broken or missing outlet elbow.

Follow the practices described under the activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

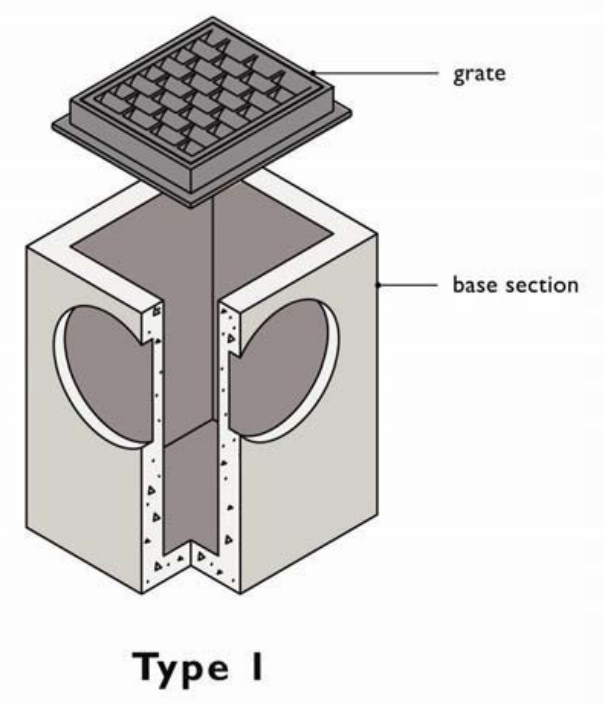

Figure 1: Catch basin Type I

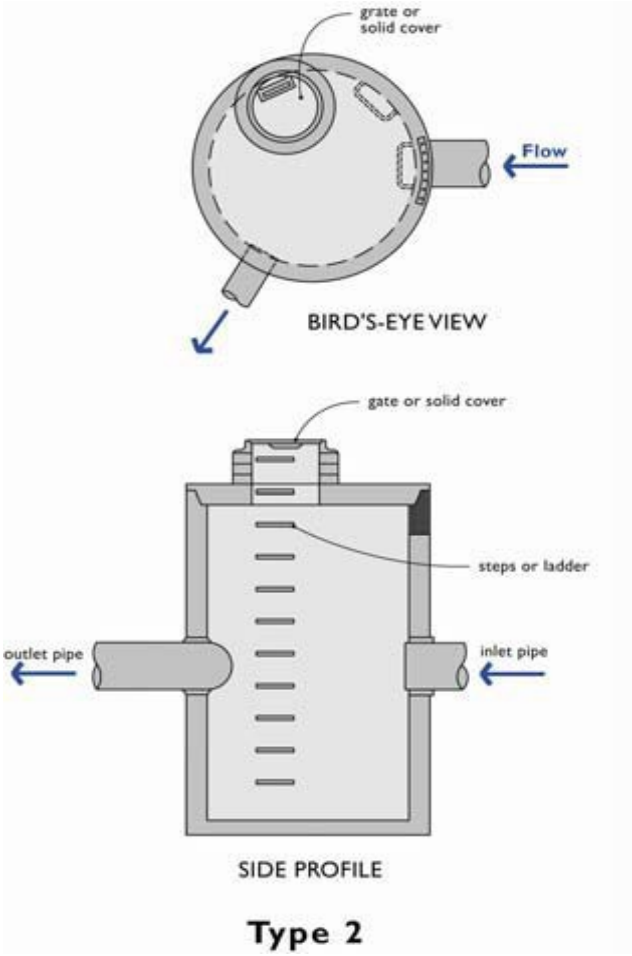

Figure 2: Catch Basin Type 2

MANHOLES

Manholes are large cylindrical vaults usually set at storm sewer pipe connections. Unless you have OSHA approved training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

Inspection

Inspect the manhole once per year. Check the frame and lid for cracks and wear, such as rocking lids or lids moved by traffic. The City of Tacoma SWMM requires:

- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections, preferably in September.

Periodically inspect the manhole and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Clean manholes when there is a blockage of a water flow path. Cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Repairs

Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs. Replace broken parts or lids that rock or are moved by traffic. Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

STORM PIPE

Storm sewer pipes convey stormwater. Pipes are built from many materials and are sometimes perforated to allow stormwater to infiltrate into the ground. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.

The City of Tacoma SWMM does not include inspection requirements or maintenance standards for storm pipes.

Inspection

Pipes are difficult to inspect, requiring special equipment and training. Port Maintenance conducts most pipe cleaning. The closed-circuit television (CCTV) inspections are usually conducted by a contractor. All inspection findings are documented and reported in order to schedule repairs or additional cleaning.

Cleaning

Pipes are recommended to be cleaned when sediment depth is greater than 20 percent of pipe diameter. When cleaning a pipe, minimize sediment and debris discharges from pipes to

the storm sewer. Install downstream debris traps (where applicable) before cleaning and then remove material.

Generally, use mechanical methods to remove root obstructions from inside storm sewer pipes. Do not put root-dissolving chemicals in storm sewer pipes. If there is a problem, remove the vegetation over the line.

Sediment and debris from pipes should be disposed in the garbage as solid waste. Pick out any rocks first.

Repairs

Repair pipes when a dent or break closes more than 20 percent of the pipe diameter.

Repair pipes damaged by rust or deterioration. Follow the practice described under the Activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

DRY DRAINAGE DITCHES

Ditches are manmade open channels that carry only stormwater. Ditches are often maintained for drainage to prevent localized flooding by draining stormwater. Maintenance includes removing sediment, debris, and overgrown vegetation. Protecting water quality dictates minimizing vegetation removal and preventing erosion. For further instruction on inspection and maintenance of ditches, refer to the Water Quality Monitoring and Protection Plan. (written by whom and where is it located?) We do have a programmatic permit with a maintenance plan and reporting obligations to Ecology. I will get a copy of this as we should reference it but it should not become part of this permit / manual. Oh, wait, this is the programmatic permit isn't it? Sigh.

Inspection

Inspect ditches during routine site maintenance or at least once per year. The City of Tacoma SWMM requires annual inspections, preferably in September.

Cleaning

- Land disturbing activities that remove vegetation or disturb soil are subject to erosion control requirements of the Port's MS4 Permit.
- If feasible, remove small amounts of sediment by hand when performing routine site maintenance.
- Vegetation should only be removed when it reduces free movement of water through the ditch. Never remove more vegetation than is absolutely needed.
- Only remove sediment when it reaches 20 percent of the ditch depth or affects the historic or designed hydraulic capacity.
- Alternate cleaning, leaving untouched sections to act as sediment-trapping filters between worked areas.
- Trap sediment that is generated by ditch maintenance to keep it from entering water bodies.

- Use sediment-trapping BMPs such as fabric fencing or filter bags at the lower end of each excavated area.
- Prevent sediment from eroding when ditch work is performed.
- Perform work during dry weather unless there is an emergency such as property or road flooding.
- Vegetate bare soils by hydroseeding or cover bare soils with an approved BMP. Hand seed for smaller areas.

WATER-BEARING DRAINAGE DITCHES

Many manmade drainage ditches carry water when it is not raining. This water comes from groundwater seeps and wetlands. These ditches can be recognized by the presence of wetland plants such as cattails. Any work that disturbs these channels may be subject to a variety of environmental regulations.

Water-bearing drainage ditches require permits for work. Requirements of county, state, and federal laws and permits may apply. Contact Environmental Compliance staff for information on acquiring permits prior to beginning work (see contact information in the Introduction).

For further instruction on inspection and maintenance of ditches refer to the Water Quality Monitoring and Protection Plan for the Port of Tacoma Stormwater Infrastructure Maintenance Program (NWS-2017-0032-WRD, WQC #15819).

ENCLOSED DRAINAGE SYSTEMS

This activity includes tasks such as repair and replacement of pipe, catch basins, drywells and manholes. It also includes drainage projects that add new pipes, catch basins, or infiltration structures. Source control BMPs are required for activities such as concrete cutting.

- Minimize vegetation removal.
- If work is near a stream or wetland, there are likely regulatory requirement. Contact Environmental Programs for more information and assistance
- If work is performed under contract, specify BMP performance under inspection/contract administration.
- Prevent debris, oils, cleaning agents, and sediment from entering waterways.
- Minimize work in wet weather. This will reduce the problems of containing sediment.
- Carry spill control kit to contain and clean up possible small spills in the work area.

Protect storm drains

- Cover storm sewer inlets, catch basins and open manholes to block sediment-bearing water.
- If runoff contains sediment, use gravel-filled filter bags or an equivalent product to build berms around inlets.
- Catch basin inserts are also an acceptable sediment trapping option.
- At stream crossings, trap materials using screens or another form of containment.
- Use BMPs to protect roadside ditches during wet weather.

- Avoid using water to clean up work sites. Sweep or vacuum dust and debris from the repair job. Do not wash materials into storm sewers.
- Place stockpiles away from drainage ways. Cover stockpiles or contain them with berms or other containment devices if there is a chance that materials will erode into a storm drain or water body.

MINOR CULVERT REPAIR (NOT IN A STREAM)

This activity is the replacement or repair of culverts and inlets less than 6 feet in diameter. It applies only to structures that are in ditches built specifically for drainage that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, a consultation with the Washington Department of Fish and Wildlife should be completed. Contact Environmental Compliance staff for assistance and to communicate with the regulatory agency (contact information is listed in the Introduction).

- Comply with stormwater and erosion control requirements.
- Minimize vegetation removal. If work is near a stream or wetland, there are likely regulatory requirements. Contact Environmental Compliance for assistance.
- Other than to address a threat to public safety or property due to flooding, perform work during the dry season.
- Minimize soil disturbance.
- Use sediment controls to trap any sediment and prevent sediment from entering storm sewer and water bodies. Sediment trapping BMPs are used to the extent practical during emergencies.
- Use cover BMPs to prevent erosion of bare soil. Vegetate bare soils.

MAJOR CULVERT REPAIR

This activity is the replacement or repair of culverts and inlets greater than 6 feet in diameter or bridging a stream or ditch with flowing water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, contact Environmental Compliance staff for assistance (contact information is listed in the Introduction).

These projects must meet all regulatory requirements, including the ones listed below.

- State Environmental Policy Act
- Shoreline Management
- Hydraulic Project Approval
- Flood Plain

DETENTION PONDS

Detention facilities are designed to hold and slowly release stormwater by use of a pond and specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, vegetation that is more natural is preferred for reduced maintenance and wildlife habitat.

Inspection

- Identify and report pollutant sources to the facility.
- Inspect the facility for oil and other pollutants and remove any pollutants greater in volume than a surface sheen.
- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections preferably in September.

Cleaning

Trash is required to be removed when it exceeds 5 cubic foot per 1000 square feet by the City of Tacoma SWMM. The Port recommends cleaning detention facilities when trash exceeds 1 cubic foot per 1000 square foot in order to maximize performance of the facility.

Sediment should be removed when it accumulates to 10 percent designed pond depth.

Vegetation Management

Mow or control vegetation to match surrounding area or sustain any other intended use of the facility, such as wildlife habitat or recreation.

Stormwater control facilities are, in effect, water body buffers in which pesticides, herbicides and fertilizer should not be used. Use mechanical methods to control weeds.

Trees should not be allowed to grow on emergency overflows and berms that are over 4 feet high. Trees can block flows and roots can lead to berm failure. Remove any trees. Remove larger roots (where the base of the tree is greater than 4 inches) and restore the berm.

See Vegetation Management section for more information.

Repairs

Repair and seed bare areas. Repair eroded slopes when rills form, where the cause of damage is present, or there is potential for future erosion. Use cover BMPs on exposed soils.

Rodent holes on a dam or berm can pipe water. Destroy the rodents, preferably by trapping, and repair the dam or berm.

Repair the liner if it is visible and repair or replace where there are more than three holes greater than ¼ inch diameter.

If berms or dams show signs of settlement or sinkholes, serious problems may be occurring. Consult a licensed professional engineer to determine the cause of the settlement or sinkhole.

Spillway areas should be completely covered by more than one layer of rock.

OIL/WATER SEPARATORS AND BURIED WET-VAULTS

An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Buried wet vaults are similar to oil/water separators in that they are sub-surface vaults that separate sediment and floating materials from stormwater. These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators. Figures 3 and 4 on the next page below show diagrams of an oil/water separator.

Inspection

- Periodically check stormwater flow out of the facility. It should be clear and not have a thick visible oil sheen.
- Annually check for cracks large enough to let soil enter the vault, broken or defective plates and baffles, and crushed or damaged pipes.
- Periodically inspect the surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping.
- Take action to have the pollutant source removed.
- Inspect water levels after an extended dry period to check for leakage.
- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections preferably in September.

Cleaning

- Remove trash and litter from the vault, inlet and piping.
- Remove oil when it reaches one-inch thickness.
- Remove sediment when it accumulates to 6 inches depth.

Repairs

- Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than ¼ inch are found. Repair any leaks that allow water levels to drop and cause oil to be washed from the unit.
- Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.
- Follow the practice described under the section for Enclosed Drainage Systems.

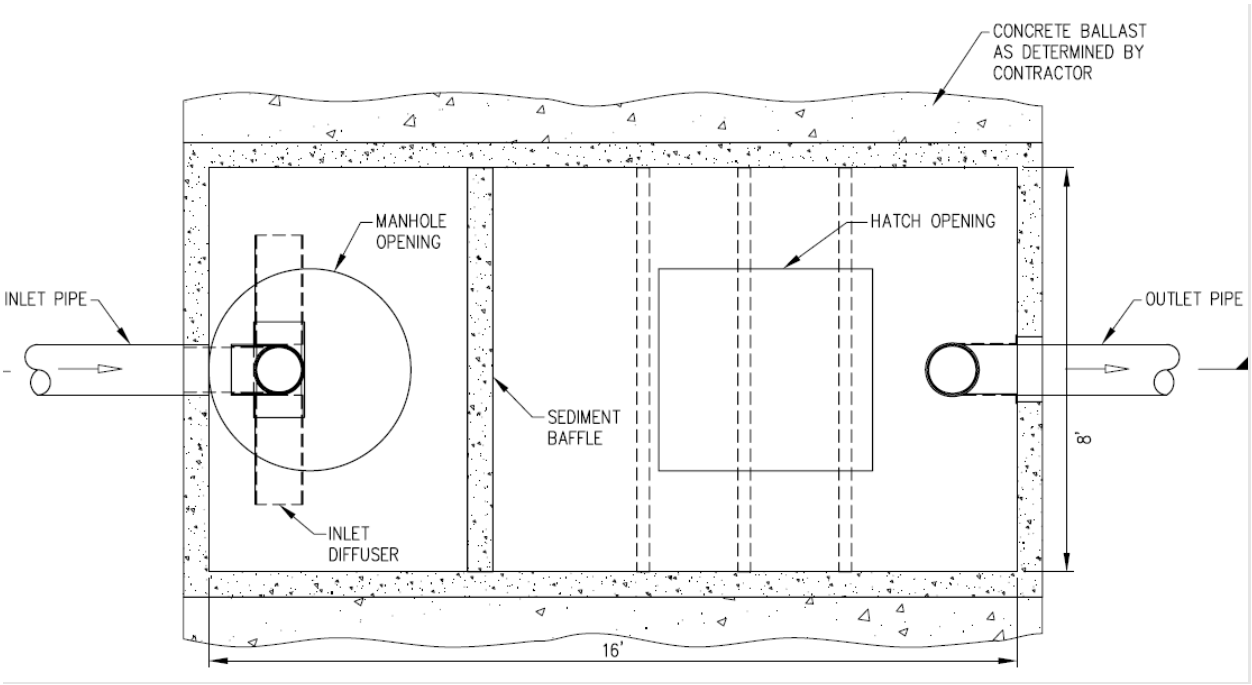

Figure 3: Oil/Water Separator – Plan View

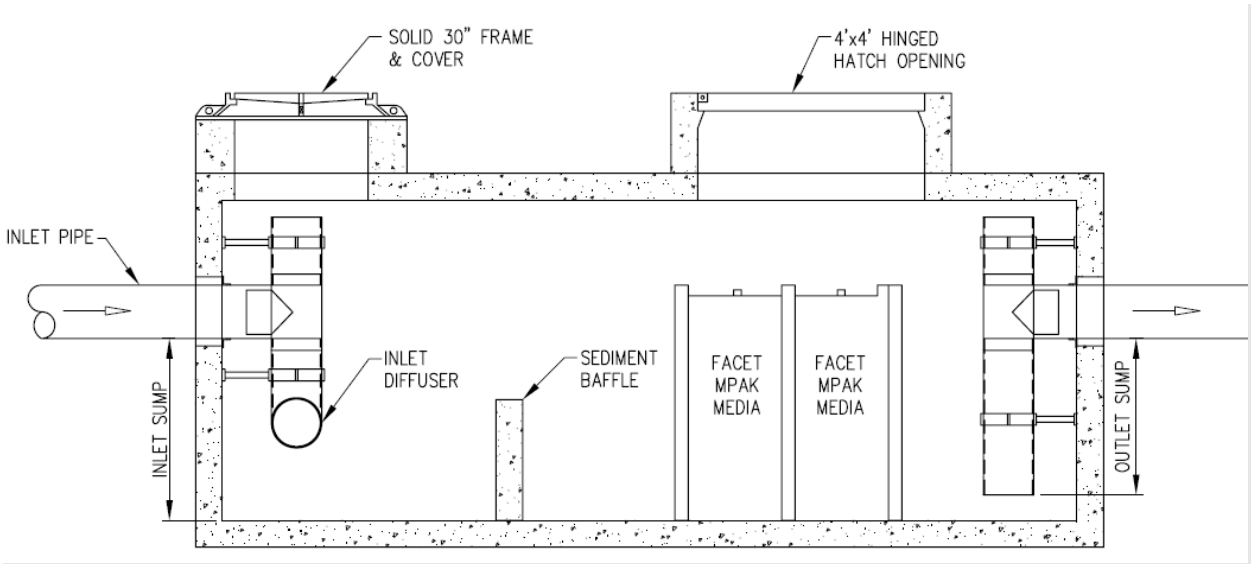

Figure 4: Oil/Water Separator – Profile View

WET BIOFILTRATION SWALES AND TREATMENT WETLANDS

Wet biofiltration swales and treatment wetlands use dense vegetation and settling to filter sediment and oily materials out of stormwater. These stormwater treatment devices must be properly maintained to sustain pollutant removal capacity. In some cases, biofiltration swales that were designed to drain between storms remain wet and need to be rebuilt or converted to wetland swales. A designed wet biofiltration swale uses wetland plants instead of grass.

InspectionXXXXXXXXXXX

- Swales are easy to inspect and need to be well maintained to treat stormwater.
- Make frequent visual inspections for problems such as bare ground, sediment and oily material.
- Identify and remove pollutant sources to the swale.
- Biannually (Spring and Fall) and after any major storm event (1" in 24 hours).

Cleaning

- Clear inlets and outlets to prevent blockage.
- Remove litter and trash when accumulation exceeds one cubic foot (about one and a half, five-gallon buckets) per thousand square feet.
- Where possible, use a rake and shovel to hand remove sediment accumulations greater than 2 inches thick in 10 percent of the treatment area.

Vegetation Management

Sparse vegetation or dense clumps of cattail do not properly treat stormwater. Try to find the cause of the problem and fix it. Cut back excessive cattail shoots.

Normally, wetland vegetation does not need to be harvested unless there is an excessive die back that causes water quality problems. If there is a problem with grass dying due to the swale being flooded during the wet season, there are two options: plant varieties that can stand being flooded or find a way to fix the swale so it drains better.

Outside of the treatment area, preserve healthy vegetation or reestablish vegetation where needed. Seed bare spots. Use cover BMPs on bare soils.

Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities. Any cut trees should be salvaged for habitat enhancement or converted to mulch or firewood.

Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer are not used. See Vegetation Management section for more information.

Repairs

- Often swales have problems due to flooding or erosion. Where possible, correct the underlying problem before trying to repair the symptom.

- Repair any defect that causes the wet swale to dry out during the wet season.
- Replace stormwater facility signs that are broken, damaged, or stolen.

CATCH BASIN INSERTS

Catch basin inserts are becoming more widely used to trap sediment and oil entering catch basins. Some involve some type of filter media and oil-absorbent pads. Others are filter fabric type inserts, sometimes referred to as catch basin sock filters.

Inspection

Inspect following the manufacturer's specifications. During the wet season (October through April), inserts should be inspected once every two weeks. Two-week inspection can determine if a longer inspection interval is appropriate at a specific site. During the dry season, inspect them at least every two months.

Periodically inspect the catch basin and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

For inserts containing filter media, the media is removed, then cleaned or disposed. It is easier to remove the filter after it has drained and dried. If this is not possible, consider contracting the service or de-watering the filter in a container.

Remove trash and litter from the filter.

If discharges have an oily sheen, replace the oil-trapping media. If the oil trapping media is full, remove it and replace it with a new one or if manufacturer's specifications allow, clean and replace it.

If sediment clogs media, clean it following manufacturer's specifications or replace the filter.

Repairs

Replace any media after typical service life.

BIOFILTRATION SWALES

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually they are look like flat-bottomed channels with grass growing in them. Swales are stormwater treatment devices that must be properly maintained to sustain pollutant removal capacity.

Inspection

- Swales are easy to inspect and need to be well maintained to treat stormwater.
- Make frequent visual inspections for problems such as bare ground, sediment and oily material.

- Identify and remove pollutant sources to the swale.
- Monthly from October - April and after any major storm event (1" in 24 hours).

Cleaning

- Clear inlets and outlets to prevent blockage.
- Remove litter when mowing or litter accumulation exceeds one cubic foot (about one and a half five-gallon buckets)
- Where possible, use a rake and shovel to hand remove sediment accumulations greater than 2 inches thick.

Vegetation Management

- Mow to keep grass at the optimum height (6 inches). Mow to no less than 4 inches height and a minimum of four cuttings per year.
- Remove clippings from the treatment area in the base of the swale. Clippings may be raked or blown onto the side slopes. If the swale has vertical walls or no side slopes, the clippings must be removed.
- Preserve healthy vegetation or reestablish vegetation where needed. Seed bare spots. Use cover BMPs on bare soils. These include hydroseeding or mulches. Trees and shrubbery should be allowed to grow unless they interfere with facility function or maintenance activities.
- Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer are not used.
- See Vegetation Management section for more information.

Repairs

Often swales have problems due to flooding or erosion. Where possible, correct the underlying problem before trying to repair the symptom.

Level spreaders must be in proper working order for swales to function properly. Where level spreaders are damaged, sunken, or bypassed by erosion, repair them to design standard.

If there is a problem with grass dying due to the swale being flooded during the wet season, there are two options: convert the swale to plant varieties that can stand being flooded or find a way to fix the swale so it drains better.

FILTERRA BIOFILTRATION UNITS

Note: *This information was taken directly from the Filterra Operation, Inspection and Maintenance Manual.*

Simple maintenance of the Filterra® is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt

and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

Americast includes a 1-year maintenance plan with each system purchase. Annual maintenance consists of a maximum of two (2) scheduled visits. The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed. Activation cannot be carried out until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed).

Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter. Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation year around to the plant of the Filterra® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the Filterra® (where the cleaned runoff drains to, such as drop-inlet) and block off the throat of the Filterra®. The Supplier should be informed immediately.

BIORETENTION FACILITIES

Bioretention facilities are engineered depressions or shallow basins used to slow and treat on-site stormwater runoff. Stormwater is directed to the basin and then percolates through the system where it is treated through physical, chemical and biological processes.

Inspection

- Identify and report pollutant sources to the facility.
- Inspect the facility for oil and other pollutants and remove any pollutants greater in volume than a surface sheen.

Cleaning

- Clean out trash and debris when present and remove excess sediment to the extent that infiltration rate is reduced.
- Remove accumulated leaves if there is a risk of clogging outlet structure or water flow is impeded.

Vegetation Management

- Remove noxious vegetation.
- Stormwater control facilities are, in effect, water body buffers in which pesticides, herbicides and fertilizer should not be used. Use mechanical methods to control weeds.
- Trees should not be allowed to interfere with operation of the facility or access for maintenance.
- See Vegetation Management section for more information.

Repairs

Repair damaged pipes, concrete structures and bar screens.

INFILTRATION BASINS AND PONDS

Infiltration facilities dispose of water by soaking it into the ground. These are open facilities that may either drain rapidly and have grass bases or have perpetual ponds that rise and fall with stormwater flows. Infiltration facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is designed to pass water into the ground, anything that can cause the base to clog is a large concern. Generally, infiltration basins are managed like detention ponds but with greater emphasis on keeping the capacity to infiltrate stormwater.

Inspection

- Check once per year after a rainstorm to see if the facility is draining as intended. Inspect annually for all features.
- A thorough inspection of the observation points should be made if there is a decrease in retention basin capacity. Inspection points can include monitoring ports built into the base of the facility and water table depth monitoring wells. Water levels in these inspection points can provide information about the performance of the facility.
- Identify and remove pollutant sources to the facility. Inspect the facility for oil and other pollutants and remove any pollutants greater in volume than a surface sheen.
- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections, preferably done in September.

Cleaning

- Trash is required to be removed when it exceeds 5 cubic feet per 1,000 square feet. The Port recommends removing trash when it exceeds 1 cubic foot per 1000 square feet.

- Remove sediment when it accumulates to 2 inches or if the facility does not drain between storms or meet 90 percent of design capabilities.
- If the facility has a sediment trap, clean out the sediment when one-half foot accumulates.

Vegetation Management

Mow or control vegetation to match surrounding area or sustain any other intended use of the facility, such as wildlife habitat or recreation.

Stormwater control facilities are, in effect, water body buffers where pesticides and fertilizer should not be used. Use mechanical methods to control weeds. See the Vegetation Management section for details.

Trees should not be allowed to grow on emergency overflows and berms that are over 4 feet high. Trees can block flows and roots can lead to berm failure. Remove any trees. Remove larger roots (where the base of the tree is greater than 4 inches) and restore the berm.

Repairs

If the facility is overflowing for storms it was designed to infiltrate, it needs to be repaired. This requires removing accumulated sediment and cleaning or rebuilding the system so that it works according to design.

Repair and seed bare areas. Repair eroded slopes when rills form, where the cause of damage is present, or there is potential for future erosion. Use cover BMPs on exposed soils.

Rodent holes on a dam or berm can pipe water. Destroy rodents, preferably by trapping, and repair the dam or berm.

Spillway areas should be completely covered by more than one layer of rock.

DRAINAGE TRENCHES (INFILTRATION TRENCHES)

Drainage trenches are subsurface gravel-lined drain fields built to infiltrate stormwater into the ground. They have a large, perforated pipe in a bed of sorted gravel. Fine oil sediment can clog drain fields and lead to localized street flooding. Also, pollutants discharged into drain field can migrate into groundwater. Drainage trenches were often installed in closed topographic depressions, areas with well-drained soils, or areas having inadequate storm sewers.

Inspection

Some drainage trenches have special inspection wells or cleanout manholes. They should be inspected at once a year and no less than once every five years.

A thorough inspection of the observation points should be made if there is a decrease in capacity. Inspection points can include, inspection ports, monitoring ports built into the trench, and water table depth monitoring wells. Water levels in these inspection points can provide information about the performance of the facility.

If there is a problem with slow drainage or the facility design rate needs to be verified.

Periodically inspect the surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Monthly from October - April and after any major storm events (1" in 24 hours).

Annual inspections preferably done in September.

Cleaning

- If a drainage trench begins to clog, try cleaning the perforated drainpipe.
- Cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Repairs

- Repairing a clogged drainage trench will likely involve excavation and replacement of part or all of the facility.
- Follow the practice described in the section for Enclosed Drainage Systems.

DRYWELLS

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oily pollutants in runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localize street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with well-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater. Because drywells can be easily clogged and tend to concentrate pollutants in one place; pollution and sediment control practices should be used to protect them.

Inspection

- Drywells should be inspected at least once a year during the wet season (October - April) and no less than once every five years.
- Periodically inspect the drywell and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.
- If a problem with flooding or slow drainage occurs, observe, or inspect the drywell for infiltration rate and observe water level depths if monitoring wells are installed.
- See Catch Basins, Manholes and Inlets Inspection Checklist for inspection components.

Cleaning

Clean out drywells when sediment depth is greater than 1/3 of the distance between the base and inlet pipe.

Drywell cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Repairs

Work in drywells requires special OSHA-required confined space equipment and procedures. The most practical method for cleaning drywells may be to contract with a sewer-cleaning contractor.

If the drywell does not dissipate stormwater, it should be replaced or repaired.

It is possible to restore some drywell capacity by water-jetting clogged openings. Another option is installing a new drywell or drainage trench, and converting the clogged drywell into a sediment trap. This has the advantage of providing a sediment trap and some amount of spill trapping. The sediment trap conversion requires grouting the holes, covering the base with concrete, and adding piping.

If there is standing water in a drywell, it probably reaches the water table. Drywells in the water table should be rebuilt to prevent stormwater from going directly into groundwater. Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.

Follow the practice described in the section for Enclosed Drainage Systems.

SAND FILTERS

Sand filters treat stormwater by filtering it through a bed of sand into an under-drain beneath the sand. They are effective at removing pollutants but must be carefully designed and well maintained. Sand filters may have serious maintenance problems in sites with excessive sediment. Along with normal maintenance, the filter media needs replacement periodically. Consult engineer's operation manual written for the sand filter or have a licensed professional engineer assist in media replacement. Sand filters are either above ground and open to view or below ground in vaults. Above ground filters are much easier to maintain. Below ground units require special training and equipment approved by OSHA for any work.

Inspection

Aboveground filters are easy to inspect and need to be well maintained to treat stormwater. Make frequent visual inspections for problems such as overtopping or bypasses, taking longer than 24 hours to draw down, and channels. Make a complete inspection of all features at least once a year.

Underground units must be inspected for all features at least once per year. More frequent inspections should be performed as a part of routine site maintenance. Check for indicators that the facility is not functioning. Examples include checking stormwater effluent for oil sheen, checking for overflowing, and checking for short circuiting.

Identify and remove pollutant sources.

Above and below ground Sand Filters inspected Monthly from October - April and after any major storm event (1' in 24 hours).

Annual inspections preferably done in September.

Cleaning

- Clean out accumulated sediment when it accumulates to 1/2-inch depth.
- Remove any trash or litter from the sand bed and other parts of the facility. Rake up and remove accumulations of leaves or other plant debris that wash into the facility and begin to form a mat.
- Clean sediment out of pre-settling chambers when 6 inches of sediment accumulates.
- Clean out any drainpipes or clean outs that become filled with sediment.

Vegetation Management

- Aboveground sand filters may or may not be designed with a vegetation surface. If a facility has vegetation, follow the maintenance procedures for a stormwater biofiltration swale.
- If it does not have designed vegetation, mechanically remove vegetation before it begins to cover parts of the facility.
- Remove all clippings or pulled weeds from the facility.

Repairs

- Where possible, correct the underlying problem before trying to repair the symptom.
- If it takes more than 24 hours for a storm to drain through the sand media or it frequently overflows, the sand media needs to be serviced. This problem is caused by fine particles clogging the sand filter. Have a licensed professional engineer oversee this procedure. At the very least, the upper few inches will need to be replaced. Sieve analyses may be helpful for determining the depth that needs to be removed and replaced with new sand. Replace clogged sand with the type of sand specified by the designer or approved by a Public Works Department Engineer.
- If there are prolonged, low rate flows into the facility due to groundwater seeps or detention facilities, route them to a smaller part of the facility using a low wood divider or shallow channel.
- The flow spreader must be level and spread flow evenly across the filter. Immediately repair any defects in the flow spreader.
- If parts of the sand filter erode, find ways to correct the problem by compacting the sand or protecting the eroding area with geotextile or other means.
- Replace or repair any damaged pipes.
- Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than ¼ inch are found.

- Repair any joints that are cracked and allow soil into the facility.
- Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.
- Follow the practice described in the section for Enclosed Drainage Systems.

ENERGY DISSIPATORS

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes.

Inspection

- Inspect at least once per year.
- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections preferably done in September.

Cleaning

Dispersion Trench: Remove sediment from pipe when it reaches 20 percent of pipe diameter.

Repairs

Follow the practice described in the section for Enclosed Drainage Systems.

- **Rock Pads:** Replace missing or moved rock to cover exposed soil and meet design standards.
- **Dispersion Trench:**
  - Repair conditions that cause concentrated flow along the trench.
  - Clean pipe perforations when one half of them are plugged or if flows bypass or overflow the trench.
- **Manhole/Chamber:**
  - When the structure deteriorates to one half its original size or it becomes structurally unsound, replace it to the design standards.

DEBRIS BARRIERS/TRASH RACKS

Trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keep pets and people out of pipes.

Inspection

- Inspect trash racks at least once per year.
- Monthly from October - April and after any major storm event (1" in 24 hours).
- Annual inspections preferably done in September.

Cleaning

Clean trash racks when debris is plugging more than 20 percent of the openings.

Repairs

- Immediately replace missing racks and missing bars.
- Replace bars that are deteriorated to the point where they may be easily removed.
- Bend bent bars back into position. Follow the practices described under the activity: Installation, Repair and Replacement of Enclosed Drainage Systems.

Access Roads and Easements -Operation and Maintenance Practices

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads should be maintained for inspection access and ease of equipment access.

Inspection

Inspect once a year or when facilities are maintained.

Cleaning

Remove litter when mowing or litter accumulation exceeds one cubic foot (about one and a half five-gallon buckets) per 1,000 square feet. Remove any debris that blocks roads or may damage tires.

Vegetation Management

Manage vegetation as for the rest of the facility.

Repairs

- Correct any bare or eroded soils by seeding or cover BMP.
- Repair road surfaces when they may lead to erosion or limit equipment access.

DOWNSPOUT BOXES

Downspout Boxes treat stormwater by filtering it through a bed of Bioretention Soil Mix (BSM) and pea gravel into an under-drain beneath the gravel. Along with normal maintenance, the filter media needs replacement periodically.

Inspection

- Downspout Boxes are easy to inspect and need to be well maintained to treat stormwater.
- Make frequent visual inspections for problems such as overtopping or bypasses or standing water.

- Make a complete inspection of all features at least twice a year (or as needed). When sampling shows the media is no longer effective, remove and replace media.
- Annual inspections should be done during wet season (October - April).

Cleaning

Remove trash and debris from filter bed.

Vegetation Management

Provide adequate irrigation year around to the plants. Trim/prune vegetation or remove nuisance vegetation to not impede flow.

FLOW CONTROL STRUCTURES

Inspection

Inspect the manhole once per year. Check the frame and lid for cracks and wear, such as rocking lids or lids moved by traffic.

Periodically inspect the manhole and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

Cleaning

Clean manholes when there is a blockage of a water flow path. Cleaning should be performed in a way that makes certain removed sediment and water is not discharged back into the storm sewer.

Repairs

Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs. Replace broken parts or lids that rock or are moved by traffic. Follow the practice described in the section for Enclosed Drainage Systems.

JELLYFISH, UP-FLO, AND STORMFILTER SYSTEMS

See Maintenance Checklists for Manufactured Media Filters and Manufacturer Operation and Maintenance Manuals.

MODULAR WETLANDS

See Manufacturer Operation and Maintenance Manuals.

VEGETATION MANAGEMENT

GENERAL GOALS AND PHILOSOPHY

The Port of Tacoma recognizes the importance of keeping polluted runoff out of Commencement Bay. All landscape management decisions for controlling unwanted vegetation, diseases, and pests should follow Integrated Pest Management (IPM) principles and decision-making rationale. These are:

- Proper planning and management decisions begin the IPM process.
- Order of preference of pest control, where feasible:
    1. Cultural methods of vegetation and pest control are preferred and are first employed.
    2. Mechanical means of vegetation and pest control
    3. Biological methods of vegetation and pest control
    4. Botanical and synthetic pesticides may be used only when no other feasible methods exist.

GENERAL PRACTICES

Use Only Appropriate Plants

The use of native plants requires less maintenance included watering and fertilizer.

Mulching

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion, and provide visual enhancement.

Always consider the possible impacts when using mulches, which may include:

- Inadvertent introduction of non-native weeds and diseases to the site.
- Leaching of substances such as tannins from the mulch into nearby waterways.
- Migration of mulch material into waterways.
- Nutrient leaching into waterways.

VEGETATION AND PEST MANAGEMENT IN STORMWATER CONTROL FACILITIES

Stormwater control facilities include biofiltration treatment swales, treatment wetlands, treatment ponds, detention ponds, open channels, and infiltration basins. Stormwater control facilities discharge to surface water or groundwater either directly or through pipes or ditches. Many facilities are built to remove pollutants from stormwater.

Generally, vegetation should be maintained to blend into surrounding areas. Stormwater facilities can provide habitat for aquatic life and birds. Promoting natural vegetation where feasible improves habitat. Swales often blend into intensively managed landscapes. Pond perimeters can include natural vegetation.

The use of pesticides and, in most cases fertilizer, is not compatible with the task of pollutant removal or the direct connection of stormwater facilities to streams and groundwater.

Features of Stormwater Facilities:

- There is a mix of native and non-native plants
- Generally not used by the public
- Include areas managed to promote design function, such as turf in swales
- Managed landscapes may be nearby

Objectives for Stormwater Facilities:

- Maintain healthy plant communities
- Minimize need for chemical intervention
- Control invasive plants where feasible
- No bare soil areas are allowed
- Tolerance for natural appearance and weeds

Practices

- The vegetation management focus is establishing and maintaining healthy low-maintenance native plantings and sustaining the design function of vegetated filters such as biofiltration swales. This includes controlling invasive plants where feasible, and planting cover on bare soils.
- In some cases, the original plantings may not be appropriate for the actual condition at a facility. One example is a frequently flooded swale that cannot support normal turf. In cases like this, replace turf with appropriate wetland plants if the underlying drainage problem cannot be fixed.
- Consider the use of soil amendments such as compost before using fertilizer.

- Limit mulch use to covering bare soil while establishing plantings.
- Chemical use should be avoided within 25 feet of any area that holds or conveys surface water or stormwater. This includes the base of a biofiltration swale.
- Trees or shrubs that block access roads may be trimmed (or removed if within the access road) at the time of when access is required for maintenance by heavy equipment.
- Trees that pose a risk to stormwater structures due to root growth may be removed and replaced by smaller shrubs.

VEGETATION AND PEST MANAGEMENT IN STORMWATER FACILITY WETLAND AREAS

Stormwater Facility Wetlands are built to treat stormwater. As water bodies, treatment wetlands connect to streams and groundwater. Wetlands also host insects, fish, amphibians, and birds that are sensitive to horticultural chemicals. Because of this, chemical use should be minimized in wetland buffers. Wetland management has a low tolerance for invasive or non-native plants.

Practices listed here only apply to parts of wetlands that are not subject to inundation during the growing season.

Features of Constructed Wetlands:

- Limited public access
- Plants may or may not be well established depending on age and condition

Objectives for Constructed Wetlands:

- Maintain healthy plant communities
- Minimize need for chemical intervention
- Low tolerance of invasive plants, non-natives
- Bare soil areas are not allowed

Practices

- There should be a plan for establishing and maintaining vegetation in a newly created wetland facility. If there is a plan, follow it. If there is not a plan, follow these practices.
- Maintenance focuses on establishing and sustaining healthy native plantings. This includes more vigorously controlling invasive plants. It also includes covering for bare soils.
- Consider the use of soil amendments such as compost before using fertilizer. Limit mulch use to covering bare soil while establishing plantings.
- Chemical intervention is minimized and is avoided; if possible, within 25 feet of areas subject to inundation during the growing season.

PESTICIDE/HERBICIDE HANDLING INFORMATION

The Port intends to protect human health and minimize its environmental footprint from the use of pesticides and herbicides. Pesticides and herbicides are used on Port premises for the control of vegetation, noxious weeds, and pests.

POLICY:

When selecting pest or weed control chemical products to be applied, the Port will use products that impose the lowest risk to human health and the environment, and still perform the task with reasonable efficiency.

Maintenance Department maintains Public Pesticide Operators Certification for pesticides and herbicides. Maintenance employees designated by the Director of Maintenance are responsible for ensuring that all regulations for approved pesticide and herbicide storage, handling, and application are followed. Any procedural problems experienced during application resulting in questionable or noncompliance activity shall be reported to the Maintenance Director for resolution.

PROCEDURE:

- The Port's Contracts and Purchasing Department should provide a copy of the Port's Certified Pesticide Operators' Certificates to the Vendor thereby allowing the Port Maintenance Department personnel to order the pesticide and herbicide products. Non-certified personnel can assist the Certified Operator. In that event, the Certified Operator must remain on site with the assistant and the level of involvement by the assistant will be governed by the Licensed Public Operator.
- Regarding the pesticide and herbicide container labeling, storage, application and disposal, Port Maintenance Department is responsible for making sure the Port's operation meets the Federal Insecticide, Fungicide and Rodenticide Act requirements.
- Original packaging of a product usually provides acceptable labeling. If the product is stored in a receptacle other than its original package, a copy of the original label will be attached.
- Labeling will be maintained on empty product containers until after they have been triple-rinsed.
- Safety data sheets will be maintained in the Parts Department and on the job site.
- Product storage should have proper security and signs.
- Product shall be protected from weather, locked from non-Port personnel access, and will have proper signs and warnings posted and clearly visible outside of the storage area.
- The applicator and tank (if not triple rinsed), when not in use, shall be secured and signed the same as stored product.
- Applicator/Site Signs shall meet Washington Administration Code requirements. Powered applicators will be prominently labeled with "Port of Tacoma", the Port phone number, and "Vegetation Management Application".

- Product applications requiring a "Restricted Entry Interval" shall not be left unattended without first posting proper signs.
- Spills will be properly cleaned up per manufacturer's instructions. Spill prevention will consist of:
    - Properly securing product during transportation to application site;
    - Closing and securing valves and lids before transporting product or applicator, empty or full;
    - Mixing product for application on site to reduce clean-up and spill hazards; and
    - Protecting stored product from damage.

Specific Training

To protect the health and safety of workers, the Maintenance Assistant Director is responsible for ensuring the Facilities Maintenance employees responsible for pesticide application are trained and certified by the Washington State Department of Agriculture in the safe use of pesticides, or the Maintenance Director hires employees who have already been trained and certified. Certificates and information on training should be forwarded to Human Resources for incorporation into the Employee Training database.

Recordkeeping

If applicable, the Port Maintenance should keep a compliance file that includes:

- A Pesticide Application Log will be kept by the Certified Operator doing the application. Completed logs pages will be sent to and kept by the Maintenance Director.
- Pesticide Applicators' certification and training records.
- Pesticide contractor records when they make applications on Port property.

REFERENCES:

Federal EPA Insecticide, Fungicide and Rodenticide Act, 1995 Worker Protection Standard (WPS) amendment

OSHA§ 1917.25 Fumigants, Pesticides, Insecticides and Hazardous Preservatives

APPENDIX A:

Maintenance Standards

APPENDIX B:

Inspection Checklists

APPENDIX C:

Manufacturer's O&M Manuals