CITY OF SNOQUALMIE

STANDARD OPERATING PROCEDURES (SOP) MANUAL

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City of Snoqualmie
Department of Public Works
38624 Southeast River Street
Snoqualmie, Washington 98065

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INTRODUCTION

This document contains standard operating procedures (SOPs) for the following City of Snoqualmie (City) operations and maintenance (O&M) activities:

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- Street cleaning
- Road repair and resurfacing, including pavement grinding
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- Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts
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- Building exterior cleaning and maintenance

This following activity is addressed through the adoption of the King County Surface Water Design Manual (KCSWDM) and is not described in detail in this SOP Manual:

- Sediment and erosion control

STANDARD OPERATING PROCEDURES

PIPE CLEANING

Description of Work

Proper inspection, maintenance, and cleaning procedures for pipes that convey stormwater is essential to ensure the proper function of the stormwater conveyance system to reduce flooding, reduce damage to both public and private property, improve water quality, and protect aquatic habitat. These procedures should be followed by stormwater O&M staff who perform routine pipe inspections, maintenance, cleaning, and disposal activities on pipes that convey stormwater.

Objectives

Clean stormwater pipes to prevent flooding, property damage, water quality impairment, and damage to the stormwater conveyance system.

BMP Equipment Checklist

- ❑ Inspection checklist
- ❑ Maintenance checklist
- ❑ Manhole puller
- ❑ Combination cleaning unit
- ❑ High-pressure jet rodder
- ❑ Containers to store and transport waste material

Work Planning

Where feasible, avoid maintenance work when rain is falling or expected.

Site Preparation

1. **Inspections:** Conduct routine pipe inspections and record results in an inspection checklist or tracking system.

2. **Document the following:**

    - Sediment, debris, or vegetation exceeds 1/4 of the diameter of the pipe and/or inhibits the ability to inspect the pipe.

- Protective coating is damaged, or rust is causing more than 50% deterioration to any part of the pipe.
- Dent or deformation decreases the cross-sectional area of pipe by more than 20% or a puncture is impacting performance.

BMP Maintenance During Site Work

1. **Cleaning:** Perform when sediment, debris, or vegetation exceeds 1/4 of the diameter of the pipe.
2. **Combination cleaning unit:**
   - Two staff shall operate a combination cleaning unit. The helper "spots" the combination cleaner next to each structure that is being cleaned.
   - Perform as many "passes" as needed with the high-pressure jet rodder until pipe is cleaned.
3. **Documentation:** As each area is cleaned, note activity on a maintenance checklist or tracking system.

Site Cleanup

4. **Disposal:**
   - Dispose of waste generated during pipe cleaning.
   - Treat liquids prior to discharge to remove suspended solids and absorbed metals.
   - Transport wastes to compliant holding location and empty into covered area.
   - Allow liquid to drain out of the material before disposing of solids in a dumpster for removal to an approved landfill.
5. **Documentation:**
   - Record the number of linear feet of pipe cleaned.
   - Keep inspection records for at least five years. Submit records to Ecology upon request.

References

King County Surface Water Design Manual (King County 2016)
Appendix A, No.6 – Conveyance Pipes and Ditches

Cleaning of Culverts that Convey Stormwater in Ditch Systems

Description of Work

Proper inspection, maintenance, and cleaning procedures for culverts that convey stormwater in ditch systems is essential to ensure the proper function of the stormwater conveyance system to reduce flooding, reduce damage to both public and private property, improve water quality, and protect aquatic habitat. These procedures should be followed by stormwater O&M staff who perform routine culvert inspections, maintenance, cleaning, and disposal activities on pipes that convey stormwater. Note: This SOP does not include procedures for maintaining in-stream culverts.

Objectives

Clean stormwater culverts to prevent flooding, property damage, water quality impairment, and damage to the stormwater conveyance system.

BMP Equipment Checklist

- ❑ Inspection checklist
- ❑ Maintenance checklist
- ❑ Combination cleaning unit
- ❑ High-pressure jet rodder
- ❑ Containers to store and transport waste material

Work Planning

Where feasible, avoid maintenance work when rain is falling or expected.

Site Preparation

1. **Inspections:** Conduct routine culvert inspections and record results in an inspection checklist or tracking system.

2. **Document the following:**

    - Sediment, debris, or vegetation exceeds 1/4 of the diameter of the culvert and/or inhibits the ability to inspect the culvert.

    - Protective coating is damaged, or rust is causing more than 50% deterioration to any part of the culvert.

- Dent or deformation decreases the cross-sectional area of the culvert by more than 20%, or a puncture is impacting performance.

- Culvert has cracks >0.5 inches wide, a buckled or bulging headwall, or erosion behind or around the ends of the headwall.

BMP Maintenance During Site Work

1. **Cleaning:** Perform when sediment, debris, or vegetation exceeds 1/4 of the diameter of the culvert.

2. **Combination cleaning unit:**

   - Two staff shall operate a combination cleaning unit. The helper "spots" the combination cleaner next to each culvert that is being cleaned.

   - Perform as many "passes" as needed with the high-pressure jet rodder until culvert is cleaned.

3. **Documentation:** As each area is cleaned, note activity on a maintenance checklist or tracking system.

Site Cleanup

1. **Disposal:** Dispose of waste generated during culvert cleaning.

   - Treat liquids prior to discharge to remove suspended solids and absorbed metals.

   - Transport wastes to compliant holding location and empty into covered area.

   - Allow liquid to drain out of the material before disposing of solids in a dumpster for removal to an approved landfill.

2. **Documentation:**

   - Record the number of linear feet of culvert cleaned.

   - Keep inspection records for at least five years. Submit records to Ecology upon request.

References

King County Surface Water Design Manual (King County 2016)
Appendix A, No.6 – Conveyance Pipes and Ditches

Ditch Maintenance

Description of Work

Ditches are open drainage systems that can be located within a road right of way (ROW), easements, tracts, public property, or on private property. This SOP focuses on routine ditch maintenance strategies which include vegetation management (e.g., mowing, brush cutting, minor reseeding/replanting, weed control, invasive species and noxious weed removal), inlet/outlet cleaning, and nuisance animal/insect control. Corrective maintenance strategies (e.g., ditch cleaning, ditch stabilization, minor ditch reshaping/regrading, major replanting/reseeding, trees of concern, minor inlet/outlet repair) may also be necessary and are described in detail in the *Field Guide to Roadside Ditch Maintenance in Western Washington* (King County and Herrera 2019).

Objectives

1. Implement ditch vegetation management to establish and maintain heathy, beneficial vegetation in ditches and control excess or unwanted vegetation. Routine maintenance strategies for vegetation management should ensure that vegetation is heathy, but does not encroach on the adjacent roadway or cause ditch capacity issues.

2. Clean accumulated sediment and blockages from inlets and outlets.

3. Control nuisance animals/insects through mechanical, manual, or chemical methods.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Mower (including a specialized mower for steep slopes)
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Reflective markers (“fish sticks”)
- ❑ Brush cutters
- ❑ Power saws
- ❑ Axes and/or machetes
- ❑ Pruning shears, loppers, and/or clippers
- ❑ Truck cover (for securing load during transport)
- ❑ Seed mix and hydroseeder (for minor reseeding/replanting)
- ❑ Post-seeding erosion control BMPs (e.g., straw mulch, biodegradable nets and blankets, coir mats)
- ❑ Required permits
- ❑ Weeding tools, weed burner, and/or weed wrench
- ❑ Targeted herbicide applicator (woody painter/herbicide wand)
- ❑ Garbage bags (to prevent seed development and dispersal)

- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets
- ❑ Animal guards for outlet pipes (if needed)
- ❑ Animal traps (if needed)

Work Planning

Where feasible, avoid maintenance work when rain is falling or expected.

Seed and/or plant during the following optimum windows:

- Late spring (April 1 through June 30)
- Early fall (September 1 through October 1)

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for the work to be performed. Refill spill kit materials as needed before beginning work.

2. **Scheduling:** Plan and schedule ditch cleaning during dry conditions, except in emergency situations.

    - Map ditch systems and document the presence of natural flow in ditches. If natural flow exists, a permit may be needed to perform maintenance in the ditch.
    - Consider source control methods upstream of ditches or opportunities to retrofit ditches to provide additional water quality treatment or flow control.

BMP Maintenance During Site Work

1. **Mowing:**

    - Set the mowing height at the highest acceptable level. For standard turf grass, mowing only the top 1/3 of the grass blade height is recommended.
    - Avoid operating mowers in wet areas or rough terrain to minimize scalping and rutting.
    - Strategize mowing direction to minimize spreading of cut material onto adjacent paver surfaces.

- If vegetation is providing flow control or treatment, too much removal or trimming could limit these functions.
- If possible, retain vegetation on the south or west side of the ditch to provide shading of the ditch and reduce water temperature.
- Use a specialized mower when steep slopes (≥ 15 percent are present)

2. **Brush Cutting:**
   - If vegetation is providing flow control or treatment, too much removal or trimming could limit these functions.
   - If possible, retain vegetation on the south or west side of the ditch to provide shading of the ditch and reduce water temperature.
3. **Minor Reseeding/Replanting:**
   - Ensure that erosion control BMPs are installed properly to avoid blockages.
   - Confirm that there are no weed seeds or invasive plant seeds in the seed mixes.
4. **Weed Control:**
   - Ensure that herbicide applications are performed by licensed, qualified staff.
   - Use physical and/or mechanical methods of vegetation removal rather than applying herbicides, where practical.
5. **Invasive Species and Noxious Weed Removal:**
   - Invasive species may need to be removed by hand.
   - Pull plants when soils are moist and before seeds are produced.
   - Identify invasive species that can and should be controlled or reduced by mowing.
   - Ensure that herbicide applications are performed by licensed, qualified staff.
6. **Inlet/Outlet Cleaning:** Clean accumulated sediment and blockages from inlets and outlets.
7. **Nuisance Animal/Insect Control:** Control nuisance animals/insects through mechanical, manual, or chemical methods.

Site Cleanup

1. **Debris Control**: Ensure all mulch, soil, vegetative matter, and/or other debris is cleaned off the road surface prior to departure from the work site. Use brooms, scoops, shovels, and/or handheld blowers appropriate for the site.

2. **Solids Disposal:** Dispose of waste generated during inlet/outlet cleaning.

    - Treat liquids prior to discharge to remove suspended solids and absorbed metals.

    - Transport wastes to compliant holding location and empty into covered area.

    - Allow liquid to drain out of the material before disposing of solids in a dumpster for removal to an approved landfill.

3. **Vegetation Disposal:**

    - Turf grass may be mulch mowed and left in place; however, large quantities of turf grass clippings may lead to outlet clogging and nutrient loading in downstream water bodies.

    - Remove cut branches/other vegetative debris after brushing to reduce outlet clogging and spreading invasive species.

    - Cover and secure the truck load when transporting grass clippings, leaves, brush, sticks, and other collected vegetation. Place collected vegetation in the appropriate piles at the maintenance facility for disposal or reuse.

    - Compost or stockpile vegetative matter in a clean green stockpile at the maintenance facility, if possible, and only if invasive species and noxious weeds are not present.

4. **Documentation:**

    - Record the number of linear feet of ditch cleaned.

    - Keep inspection records for at least five years.

    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Field Guide for Roadside Ditch Maintenance in Western Washington (King County 2019)	Stormwater Pollution Prevention Manual (King County 2016)
1.111 – Vegetation (Equipment/Tools Cleanup and Maintenance)	Appendix A, No.6 – Conveyance Pipes and Ditches	Routine maintenance Corrective maintenance	Chapter 3 – Nonstructural Source Control BMPs; A-26 – BMPs for Landscaping and Vegetation Management

Street Cleaning

Description of Work

Routine sweeping of streets with sweepers (see Figure 1) to remove accumulated dirt and debris for safe, clean streets including the sweeping of designated routes, grids, and any non-route sweeping of streets resulting from complaints or other situations requiring a sweeper.

Figure 1. Regenerative air street sweeper (SDOT)

Objectives

Reduce sediments and contaminants, such as petroleum hydrocarbons, heavy metals, road wash-off, snow sand, and debris, from reaching the stormwater, watercourse, stream system and other water bodies. Reduce occurrence of flooding and debris clogged drain inlets, and provide a safe roadway surface for the traveling public.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Mechanical or regenerative air street sweeper

Work Planning

Where feasible, avoid maintenance work when rain is falling.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Sweeping:**

    - Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose). Washing is not an alternative to sweeping and vacuuming because of the risk of pollutant transport.

    - Schedule sand removal as part of the snow and ice emergency response if sand was used during the event.

BMP Maintenance During Site Work

1. **Sweeping:**
    - Control speed of sweeper to minimize airborne particulates and remove maximum amount of debris.
    - Use water spray system on sweeper to reduce dust.
    - Use pickup brooms as needed.
    - Avoid sweeping up any unknown substance or any object that may be potentially hazardous.
    - Adjust brooms frequently; maximize efficiency of sweeping operations.
    - Prevent sediment from entering storm drain system.
    - Do not sweep during heavy rain events.

Site Cleanup

1. **Sweeping:** Inspect and sweep visible sediment at storage yard on a daily basis.
2. **Equipment and Vehicle Maintenance:**
    - Clean equipment at wash racks.
    - Perform equipment and vehicle maintenance in areas that prevent discharges to the storm drain system.
3. **Waste Disposal:** Properly dispose of sweeper wastes at an approved dump site after sweeping is finished.
4. **Documentation:**
    - Record the area swept.
    - Keep inspection records for at least five years.
    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	Stormwater Pollution Prevention Manual (King County 2016)
2.152 - Sweeping	Disposal Information Sheet A-11 – Cleaning or Washing of Tools and Equipment

Road Repair and Resurfacing, Including Pavement Grinding

Description of Work

Road repair includes all maintenance, repair, or construction performed to roadways including:

- Repairing road base by recompacting disturbed material and/or over digging and replacing with ledge rock, surface leveling, and removal of signal traffic pads.
- Grading dirt streets and alleys including ripping surface to remove chuck holes, scribing gutter line down both sides of street, and adding ledge rock/asphalt grindings as necessary to reestablish crown.
- Reshaping gravel shoulders with grader to smooth out chuck holes and edge ruts and bring material up to edge, developing drainage pathways, and eliminating hazards to traffic.
- Adding material to shoulders, pathways, and gravel streets to replace lost material including building up shoulders after resurfacing or other asphaltic improvements to the streets to provide lateral support for street.

Objectives

Prevent sediment from entering drainage systems, sensitive areas, and water bodies.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Catch basin filter sock or filter fabric
- ❑ Water bladder, sandbag barrier, or containment berm
- ❑ Straw wattles
- ❑ Brooms
- ❑ Vactor truck (optional)
- ❑ Grader

Work Planning

Where feasible, avoid repair work when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Catch Basin Filter Sock or Filter Fabric:** Use the following best management practices (BMPs) over any catch basin or storm drain inlets that are connected to the storm drain system and are located downslope or adjacent to the work area.

    - **Structures less than 12-inches deep:** Remove debris using a mechanical street sweeper or by hand sweeping. Filter fabric (see Figure 1) may also be used to prevent large debris from entering catch basins, but it must be removed immediately after cleaning to prevent the risk of flooding during storm events.

    - **Structures greater than 12-inches deep:** Install a storm drain or catch basin filter sock (see Figure 2). Filter fabric may also be used to prevent large debris from entering catch basins, but it must be removed immediately after cleaning to prevent the risk of flooding during storm events.

        - Place the appropriate size filter sock or type of filter fabric in the storm drain or catch basin.

        - Place the storm drain or catch basin grate on top of the filter sock or filter fabric to hold it in place.

        - Trim and remove filter sock or filter fabric material that extends beyond the grate.

Figure 1. Filter fabric.

Figure 2. Catch basin filter sock.

Figure 3. Water bladders and straw wattles used for containment.

3. **Water Bladder:** Use a water bladder, sandbag barrier, or containment berm to direct stormwater run-on around the construction site (see Figure 3).

4. **Straw Wattles:**

    - Install straw wattles (see Figure 3) if warranted by the size of the project, if the project will last multiple days, or if the project is located adjacent to a sensitive area.

    - Silt fences, coir logs, or other BMPs may be appropriate depending on the size and location of the project.

BMP Maintenance During Site Work

1. **Catch Basin Filter Sock:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

2. **Filter Fabric:** Check filter fabric during work to ensure that it is not clogged or causing localized flooding.

3. **Grading and Patching:**

    - Continually monitor operations and installed BMPs to determine if erodible soils, stockpiles, or sediment laden stormwater could enter the stormwater system or a water body. If observations indicate offsite migration of erodible soils or sediment laden stormwater could occur, repair existing BMPs or implement additional BMPs to contain soils and sediment laden stormwater onsite. If this does not resolve the issue(s), stop operations and immediately implement preventative measures such as berms, barriers, secondary containment, and vactor trucks.

    - Where feasible, avoid grading and patching when rain is falling or expected.

4. **Straw Wattles:** Remove sediment around straw wattles when deposits reach one-half the height of the wattle.

5. **Sweeping:** Frequently sweep paved surfaces directly adjacent to the work area to remove accumulated debris and other material that could otherwise be washed off by stormwater. Do not sweep this debris into storm drains.

Site Cleanup

Figure 4. Manual sweeping.

1. **Catch Basin Filter Sock or Filter Fabric:**
    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping after flushing has been completed.
    - Remove the filter sock or filter fabric carefully to ensure that the collected sediment does not fall into the catch basin or storm drain inlet.
    - Dispose of the collected sediment in a suitable container to be hauled off site.
    - Reuse the filter sock or filter fabric at another site if it remains in good condition (e.g., no rips, tears, or visible staining).
    - *Optional BMP:* Use a vactor truck to clean any water or sediment out of the catch basin or storm drain inlets.
2. **Straw Wattles:**
    - Evaluate site to determine if straw wattles are no longer needed (the area has stabilized; potential of sediment laden water exiting the area has passed).
    - Remove sediment buildup in front of straw wattles before removing them.
3. **Waste Disposal:**
    - Sweep or shovel loose aggregate chunks and dust and collect the material for recycling or proper disposal at the end of each workday (see Figure 4).
    - Remove waste materials from the site and dispose of them properly.
4. **Documentation:**
    - Record the area repaired/maintained.
    - Keep inspection records for at least five years.
    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.31 - Coir Log 2.79 - Inlet Protection 2.152 - Sweeping	C.3.9 – Storm Drain Inlet Protection D.2.1.2.5 – Straw Wattles	Chapter 3 – Nonstructural Source Control BMPs; Disposal Information Sheet

Snow and Ice Control

Description of Work

Before the storm

O&M staff prepare equipment for snow and ice response by removing tailgate of the dump truck, loading the drop-in sander, tying down the sander, loading materials, calibrating equipment, and installing chains on vehicles.

During the storm

O&M staff patrol and inspect streets, bridges and known trouble spots during potential icy conditions. Crews apply salt or chemical mixture, plow arterial streets, bus routes and trouble spots to remove snow and ice during a snowstorm, remove accumulated snow immediately after the storm.

After the storm

O&M staff manage other problems resulting from a snowstorm including cleaning frozen drainage inlets, sanding stairways, removing sand and ice from sidewalk and landings, and calibrating equipment. Sweep streets and alleys to remove sand and snow after the snow and ice event.

Objectives

Before the storm

Prevent sediment or contaminants from being released to stormwater, watercourses, streams, and other water bodies while readying/preparation snow and ice equipment.

During the storm

Reduce vehicle accidents that may adversely impact sensitive areas. Minimize pollutants resulting from vehicle accidents such as petroleum hydrocarbons, heavy metals, and road wash-off from entering storm drainage/stream system.

After the storm

Reduce the amount of sediment and contaminants from snow and ice control activities from reaching stormwater, watercourses, streams, and other water bodies. Reduce occurrence of flooding and debris clogging drain inlets, as well as provide safe sidewalk, stairway, and roadway surfaces for the public.

BMP Equipment Checklist

- ❑ Spill Kit
- ❑ Snow emergency vehicles: plows and salt trucks
- ❑ Broom
- ❑ Mechanical street sweeper
- ❑ Drip pan
- ❑ Attenuator truck (optional)
- ❑ Dump truck (optional)

Work Planning

Complete activities before, during, and after snow and freezing weather events.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Equipment Maintenance:**

    - Place drip pans or other appropriate temporary containment devices in locations where leaks or spills may occur such as hose connections, hose reels, and filler nozzles.

    - Always use drip pans when making and breaking connections.

    - Check loading and unloading equipment such as valves, hoses, pumps, flanges, and connections regularly for leaks, and repair as needed. Document and keep all inspection records.

    - Prevent clean stormwater from entering the loading/unloading area and conduct the activity under cover or indoors if possible.

3. **Sweeping:**

    - Collect any spilled sand or deicing materials using hand brooms or mechanical sweepers as needed.

    - Frequently sweep surfaces including those that have been covered with containers, logs, or other material, to remove accumulated debris and other material that could otherwise be washed off by stormwater. Do not sweep this debris into storm drains.

4. **Deicers:**

    - Apply deicers only as needed using minimum quantities.
    - Perform before storm hits when streets are generally in good condition when possible and only patches of ice/snow may exist (temperature must be below 35 degrees or continuing to drop).
    - Select deicers and anti-icers that result in the least adverse environmental impact. If needed for safety, use deicers such as calcium magnesium acetate, potassium acetate, or similar materials that cause less adverse environmental impact than urea, and sodium chloride.
    - Store and transfer deicing and anti-icing materials in a covered area on an impervious containment pad.

BMP Maintenance During Site Work

1. **Deicers:** Inspect roadway conditions daily during potential icy conditions and apply deicer when needed.

2. **Sweeping:**

    - Sweep or clean up accumulated sand and grit from roads as soon as possible after the road surface clears if sand was used as part of the snow and ice emergency response.
    - Prioritize cleanup efforts to minimize impacts to aquatic habitat areas.
    - Prioritize cleanup in areas without sediment collection systems.
    - Increase maintenance of stormwater structures as necessary.
    - Control speed of sweeper to minimize airborne particulates and remove maximum amount of debris.
    - Use water spray system on sweeper to reduce dust.
    - Use pickup brooms as needed.
    - Avoid sweeping up any unknown substance or any object that may be potentially hazardous.
    - Adjust brooms frequently; maximize efficiency of sweeping operations.
    - Prevent sediment from entering storm drain system. Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may

need to be scraped loose). Washing is not an alternative to sweeping and vacuuming because of the risk of pollutant transport.

- Sweeping includes both the curbline and centerline.
- Use attenuator truck for back-up on high speed arterial streets.
- Work in tandem with another sweeper as required.
- Dump sweeper waste into a dump truck to minimize the number of trips.

Site Cleanup

1. **Documentation:**
   - Document areas where snow and ice control have occurred.
   - Keep records for at least five years.
   - Submit records to Ecology upon request.
2. **Equipment and Vehicle Maintenance:**
   - Clean equipment at wash racks.
   - Perform equipment and vehicle maintenance in areas that prevent discharges to the storm drain system.
3. **Waste Disposal:** Properly dispose of sweeper wastes at an approved dump site after sweeping is finished.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.152 - Sweeping	C.3.9 – Storm Drain Inlet Protection D.2.1.2.5 – Straw Wattles	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-16 –Truck or Rail Loading and Unloading of Liquid or Solid Material A-40 – Street Deicing Operations Disposal Information Sheet

Utility Installation

Description of Work

Installation of catch basins and piping can involve saw cutting concrete or asphalt pavement, excavation or installation and compaction of subgrade material, and repairing asphalt or concrete surfacing to complete the work.

Objectives

Prevent sediment and pollutants from entering stormwater drainage systems, sensitive areas, and water bodies during installation or repairs to catch basins and stormwater conveyance piping.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Catch basin filter sock or filter fabric
- ❑ Vacuum (for slurry)
- ❑ Water bladder, sandbag barrier, or containment berm
- ❑ Straw wattles
- ❑ Pipe plugs
- ❑ Brooms
- ❑ Shovels
- ❑ Vactor truck (optional)

Work Planning

Where feasible, avoid installation and repair work when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for the work to be performed. Refill spill kit materials as needed before beginning work.

2. **Filter Fabric or Catch Basin Filter Sock:** Use filter fabric or catch basin filter socks over any catch basins or inlets that are connected to the storm drain system and located downslope or adjacent to the work area.

- Structures less than 12-inches deep: Remove sediment and debris from the road surface using a mechanical street sweeper or by hand sweeping. Filter fabric (see Figure 1) may also be used to prevent sediment and debris from entering catch basins, but must be removed immediately after work is completed and the road surface is cleaned to prevent the risk of flooding during storm events.

- Structures greater than 12-inches deep: Install a storm drain or catch basin filter sock (see Figure 2). Filter fabric may also be used to prevent large debris from entering catch basins, but must be removed immediately after work is completed to prevent the risk of flooding during storm events.

    - Place the appropriate size filter sock or filter fabric in the storm drain or catch basin.

    - Place the storm drain or catch basin grate on top of the filter sock or filter fabric to hold it in place.

    - Trim and remove excess filter sock or filter fabric material that extends beyond the grate.

Figure 1. Filter fabric.

Figure 2. Catch basin filter sock.

3. **Water Bladder:** Use a water bladder, sandbag barrier, or containment berm to direct stormwater around the work area (see Figure 3).

4. **Straw Wattles:**

    - Install straw wattles on large projects, if the project work will last multiple days, or if the project is located adjacent to a sensitive area (see Figure 3).

    - Silt fences, coir logs, or other BMPs may also be useful depending on the size and location of the project.

5. **Pipe Plugs:** Install **plugs** to block pipe inlets and outlets before the start of catch basin installation and repair work (see Figure 4).

Figure 3. Water bladders and straw wattles used for containment.

BMP Maintenance During Site Work

1. **Filter Fabric:** Check filter fabric during work to ensure that it is not clogged or causing localized flooding.

2. **Catch Basin Filter Socks:** Clean or remove and replace filter socks when they are one-third full of sediment (unless a different standard is specified by the product manufacturer).

3. **Vacuuming:** Use a wet vacuum to capture saw cutting slurry and remove it from the site (see Figure 5). Cover or otherwise protect catch basins and inlet grates during saw cutting to contain slurry for vacuuming and prevent it from entering the storm drain system.

4. **Water Bladder:** Check for leaks under water bladders, sand bag barriers, or containment berms and make repairs as needed.

5. **Straw Wattles:** Remove sediment around straw wattles when deposits reach one-half the height of the wattle.

6. **Sweeping:** Frequently sweep paved surfaces directly adjacent to the work area to remove accumulated debris and other material that could otherwise be washed off by stormwater. Do not sweep this debris into storm drains.

Figure 4. Pipe plug installed prior to catch basin repair work.

Figure 5. Vacuuming slurry during concrete cutting.

Site Cleanup

1. **Filter Fabric or Catch Basin Filter Socks:**

   - Carefully remove the filter sock or filter fabric to ensure that the collected sediment does not fall into the catch basin or storm drain inlet.

   - Remove sediment in front of the catch basin or storm drain inlets by hand sweeping after flushing the storm drain mainline has been completed.

- Dispose of the collected sediment in a suitable container to be hauled off site.
- Reuse the filter sock or filter fabric at another site if in good condition (e.g., no rips, tears, or visible staining).
- Optional BMP: Use a vactor truck to clean any water or sediment out of catch basins or storm drain inlets.

2. **Vactoring and Pipe Plug Removal:** Vactor out sediment in pipes or catch basins following installation or repair work and prior to removing plugs from pipe inlets and outlets.

3. **Straw Wattles, Water Bladders, Sand Bag Barriers, and Containment Berms:**
   - Evaluate the site to determine if straw wattles are no longer needed (the area has stabilized and the potential for sediment laden water to migrate offsite has passed).
   - Remove sediment buildup in front of straw wattles, water bladders, sand bag barriers, and containment berms before removing them.

4. **Waste Disposal:**
   - Sweep or shovel loose asphalt chunks and dust and collect the material for recycling or proper disposal at the end of each workday.
   - Remove waste materials (such as plastic or unusable scraps of filter fabric) from the site and dispose of them properly.

5. **Documentation:**
   - Document the areas where installation / repair has occurred.
   - Keep records for at least five years.
   - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.31 – Coir Log 2.79 – Inlet Protection 2.152 – Sweeping	C.3.9 – Storm Drain Inlet Protection D.2.1.2.5 – Straw Wattles	A-20 – Concrete and Asphalt Application Disposal Information Sheet

Pavement Striping Maintenance

Description of Work

This activity involves the placement of roadway striping (centerline or edge-line) using air-delivered, waterborne, non-toxic paint and reflective glass beads.

Objectives

Prevent roadway striping paint from entering stormwater drainage systems, sensitive areas, and water bodies.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers

Work Planning

Where feasible, avoid pavement striping work when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for the work is to be performed. Refill spill kit materials as needed before beginning work.

2. **Drain Covers**: Cover any storm drain inlets that may come in contact with paint with a portable drain cover (see Figure 1).

Figure 1. Drain cover used during a pavement striping application.

BMP Maintenance During Site Work

1. **Drain Cover:**

    - Ensure that the drain cover remains in place during painting activities and is moved to new storm drains as the crew progresses.

Site Cleanup

1. **Drain Covers:**

    - Remove vegetation and any sediment or dirt buildup on top of and adjacent to the storm drain inlet by hand sweeping.

    - Remove drain cover.

2. **Paint Disposal:**

    - Wash water from latex paints can be disposed of to the sanitary sewer.

    - Empty containers of latex paint can be left open to dry out any residual paint, and then disposed of in the garbage or taken to a transfer station for disposal.

    - Residual oil-based paint, paint thinners, and solvents must be disposed of as hazardous waste.

References

King County Surface Water Design Manual (King County 2016)
C.3.9 – Storm Drain Inlet Protection

Maintaining Roadside Areas, Including Vegetation Management

Description of Work

Crews responsible for roadside vegetation maintenance (separate from ditch maintenance and maintenance of other stormwater facilities) complete a variety of activities: mowing, watering, weed control, litter pick-up, leaf pick-up, and tree maintenance.

Objectives

Implement proper landscaping and erosion control techniques to prevent plant material and sediment from entering drainage systems. Use proper fertilizer and herbicide application techniques to minimize contamination of stormwater and only if other alternatives would not achieve desired results. Utilize alternatives to pesticides when possible.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Mower (including a specialized mower for steep slopes)
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Brush cutters
- ❑ Power saws
- ❑ Axes and/or machetes
- ❑ Pruning shears, loppers, and/or clippers
- ❑ Truck cover (for securing load during transport)
- ❑ Seed mix and hydroseeder (for minor reseeding/replanting)
- ❑ Post-seeding erosion control BMPs (e.g., straw mulch, biodegradable nets and blankets, coir mats)
- ❑ Weeding tools, weed burner, and/or weed wrench
- ❑ Targeted herbicide applicator (woody painter/herbicide wand)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets

Work Planning

Each of these activities requires that the current and near-term weather conditions be considered when planning work. Chemical applications require close attention to labeling to prevent unintended movement of chemicals over or through the soil.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Sensitive Area Considerations:** Minimize work and machinery in environmentally critical sensitive areas to what is necessary. Stabilize soils as necessary.

3. **Activities Requiring the Use of Pesticides or Fertilizers:** Refer to the *Fertilizer, Pesticide, and Herbicide Application SOP*.

4. **Mulching:** Use appropriate mulch materials and application rates.

BMP Maintenance During Site Work

1. **Activities Requiring the Use of Pesticides or Fertilizers:** Refer to the *Fertilizer, Pesticide, and Herbicide Application SOP*.

2. **Activities Not Requiring the Use of Pesticides or Fertilizers:**

   - **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

     - Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric, or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

     - Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than one day) that impact a series of catch basins adjacent to the work site.

- Place the appropriate size filter sock in the catch basin or storm drain inlet.
- Place the storm drain or catch basin grate on top of the filter sock to hold it in place.

- Trim and remove filter sock material that extends beyond the grate.
- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (Figure 4).
- **Cleaning and Repair of Tools and Equipment:**
  - Use non-toxic solvents whenever possible if solvents are necessary.
  - Use phosphate-free detergents when practical.
  - Use drip pans (see Figure 5) under equipment when maintaining, repairing, or servicing in the field.

Figure 2. Catch basin filter sock

Figure 3. Water-filled barrier dam and straw wattles used for containment.

Figure 4. Raking debris out of surface runoff channel.

Figure 5. Example of drip pan used for equipment maintenance.

- **-Hand Watering:**
  - Do not leave manual surface watering devices unattended without an automatic timer.
  - Ensure that water delivery does not exceed the soil's current capacity to absorb water (do not allow runoff from the site)
  - When possible, use tree watering bags to apply water over a long period of time.
  - Allow for a schedule that accommodates slow water delivery resulting in deep water penetration.
- **Mowing:**
  - Pick up and properly contain all litter at the mow site prior to mowing to prevent mulching of debris into the turf.
  - Strategize mowing direction to minimize to the maximum extent feasible the spreading of cut material onto adjacent paved surfaces.
  - Use mulching blade kits to recycle grass back into the landscape.
  - Quickly remove cuttings from paved surfaces before moving to the next mow location.
- **Leaf Pick Up:**
  - Schedule the work as early as possible in the fall, preferably before the seasonal rainfall peaks.
  - Take the time to locate drain covers that may be buried in the leaf material prior to start of work.
  - Remove litter from leaf piles to the greatest extent feasible prior to initiating work.
- **Mulching:**
  - Mulch when needed (see Figure 6).

Figure 6. Mulching (SDOT).

        - Increase mulch thicknesses for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.
        - Check mulched areas periodically, especially following severe storms. Repair damaged areas of mulch or tie-down material.
    - **Grass Seeding:** Seed as necessary. Place jute mat or similar cover on steep slopes.

Site Cleanup

1. **Pesticides/Noxious Weed Removal:** Dispose of all pesticide containers only after careful cleaning and rinsing, and ensure that all pesticide contaminated materials are appropriately disposed of in the hazardous waste facility.
2. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.
3. **Catch Basin Filter Socks:**
    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.
    - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.
    - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).
4. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.
5. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels and/or handheld blowers appropriate for the site.
6. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse. Chip tree limbs and store in mulch pile for reuse.
7. **Litter Pick Up:** Ensure that all litter is collected in the appropriate containers and secured for safe transport to the transfer facility.
8. **Waste Disposal:**

- Remove and dispose of accumulated solid waste at authorized disposal areas.
- Label waste containers and place them in a covered area. Keep lids closed at all times.

9. **Cleaning and Repair of Tools and Equipment:**
    - Collect and properly manage (recycle or dispose of) used materials such as grease, oil, oil filters, antifreeze, cleaning solutions, lead-acid batteries, hydraulic and transmission fluids, and tires.
    - Dispose of these wastes at recycling facilities; municipal solid waste disposal facilities; hazardous waste treatment, storage, and disposal (TSD) facilities; or the sanitary sewer as required.
    - Salvage and recycle any useful materials.
10. **Documentation:**
    - Record maintenance activities.
    - Keep records for at least five years.
    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	**King County Surface Water Design Manual (King County 2016)**	**Stormwater Pollution Prevention Manual (King County 2016)**
1.110 – Vegetation (Mowing) 1.111 – Vegetation (Equipment/Tools Cleanup and Maintenance) 2.79 – Inlet Protection	C.3.3 – Nets and Blankets C.3.7 – Vegetated Strip C.3.9 – Storm Drain Inlet Protection D.2.1.2.6 – Temporary and Permanent Seeding	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Dust Control

Description of Work

Dust control shall be implemented when exposed soils are dry to the point that wind transport is possible and roadways, drainage ways, or surface waters are likely to be impacted. Dust control measures may consist of chemical, structural, or mechanical methods. O&M staff should apply a dust palliative (dust control material) to previously prepared dirt streets for the purpose of limiting the emission of dust into the air and eliminating the need for constant restoration with grader. Water is the most common palliative used. Calcium chloride, magnesium chloride, lignin derivatives, tree resin emulsions, and synthetic polymer emulsions may also be used for dust control.

Objectives

Prevent sediment and oil from palliative application from entering drainage systems, sensitive areas, and water bodies and prevent wind transport of dust from exposed soil surfaces onto roadways, drainage ways, and surface waters.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Catch basin filter sock or filter fabric
- ❑ Tanker truck
- ❑ Dust palliative
- ❑ Vactor truck (optional)

Work Planning

Where feasible, avoid repair work when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Catch Basin Filter Sock or Filter Fabric:** Use the following best management practices (BMPs) over any catch basin or storm drain inlets that are connected to the storm drain system and are located downslope or adjacent to the work area.

- **Structures less than 12 inches deep:** Remove debris using a mechanical street sweeper or by hand sweeping. Filter fabric (see Figure 1) may also be used to prevent large debris from entering catch basins, but it must be removed immediately after cleaning to prevent the risk of flooding during storm events.

- **Structures greater than 12 inches deep:** Install a storm drain or catch basin filter sock (see Figure 2). Filter fabric may also be used to prevent large debris from entering catch basins, but it must be removed immediately after cleaning to prevent the risk of flooding during storm events.

    - Place the appropriate size filter sock or type of filter fabric in the storm drain or catch basin.

    - Place the storm drain or catch basin grate on top of the filter sock or filter fabric to hold it in place.

    - Trim and remove filter sock or filter fabric material that extends beyond the grate.

Figure 1. Filter fabric.

Figure 2. Catch basin filter sock.

3. **Loading and Unloading:** Check loading and unloading equipment such as valves, hoses, pumps, flanges, and connections regularly for leaks when loading tanker truck with water and CMS-2 and repair as needed.

4. **Dust Palliative Application:** Use only the recommended amounts of chemical materials and apply them in a proper manner to reduce the potential for polluting stormwater and surface waters.

    - Do not use Lignin Sulfonate near surface water systems

BMP Maintenance During Site Work

1. **Catch Basin Filter Sock:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

2. **Filter Fabric:** Check filter fabric during work to ensure that it is not clogged or causing localized flooding.

3. **Apply liquid palliatives:**

    - Blade a small surface
    - Crown or slope surface to avoid ponding
    - Compact soils if needed
    - Uniformly pre-wet at 0.03 – 0.3 gallons/square yard
    - Apply solution under pressure. Overlap solution 6 to 12 inches.
    - Allow treated area to cure for 0 to 4 hours
    - Compact area after curing
    - Apply second treatment before first treatment becomes ineffective (per manufacturer's instructions)

Site Cleanup

1. **Catch Basin Filter Sock or Filter Fabric:**

    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping after flushing has been completed.
    - Remove the filter sock or filter fabric carefully to ensure that the collected sediment does not fall into the catch basin or storm drain inlet.
    - Dispose of the collected sediment in a suitable container to be hauled off site.
    - Reuse the filter sock or filter fabric at another site if it remains in good condition (e.g., no rips, tears, or visible staining).
    - *Optional BMP:* Use a vactor truck to clean any water or sediment out of the catch basin or storm drain inlets.

2. **Documentation:**

    - Track dust control applications.
    - Keep records for at least five years.
    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.61 – Dust Control	D.2.1.8 – Dust Control C.3.9 – Storm Drain Inlet Protection	A-16 – Truck or Rail Loading and Unloading of Liquid Materials

Fertilizer, Pesticide, and Herbicide Application

Description of Work

Herbicide, pesticide, and fertilizer application along roadside right of ways (ROWs) is conducted for infrastructure maintenance and roadside safety concerns. Roadside spraying is also conducted in response to citizen requests and for compliance with directives from the King County Noxious Weed Control Board. Stormwater runoff from areas that have been subject to uncontrolled or inappropriate herbicide, pesticide, and fertilizer application may be contaminated with nutrients, toxic organic compounds, and/or metals.

Objectives

Implement proper ROW herbicide, pesticide, and fertilizer application BMPs in order to prevent stormwater pollution.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers
- ❑ Brooms
- ❑ Shovels
- ❑ Signs (to notify the public of recent herbicide or pesticide applications)

Work Planning

Never apply pesticides and fertilizers if it is raining or about to rain.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for the work is to be performed. Refill spill kit materials as needed before beginning work.

2. **Drain Covers**: Cover any storm drain inlets that may come in contact with fertilizers, herbicides, and/or pesticides with a portable drain cover (see Figure 1).

Figure 1. Drain cover used during application of fertilizers, herbicides, or pesticides on adjacent property.

3. **Herbicide or Pesticide Use:** All personnel applying herbicides and/or pesticides to the ROW should be certified by the Washington State Department of Agriculture or directly supervised in the field by certified applicators.

   Choose the least toxic herbicide or pesticide that is capable of reducing the infestation to acceptable levels. Ensure that all work practices conform to Integrated Pest Management strategies.

4. **Fertilizer Use:**

   - Fertilizers should only be applied by properly trained personnel.
   - Determine the proper fertilizer application for the types of soil and vegetation encountered.
   - Time the fertilizer application to periods of maximum plant uptake. Fertilizers should also be applied in amounts appropriate for the times in the year that minimize losses to surface water and groundwater. In addition, slow release fertilizers should be encouraged and used when appropriate.

5. **Consider Alternatives to the Use of Herbicides, Pesticides, or Fertilizers in ROWs:**

   - Consider manual and/or mechanical alternatives to the use of herbicides or pesticides, such as covering/smothering, burning, substituting other plant species, or weeding.
   - Also consider using soil amendments, such as compost or mulch, as an alternative to fertilizer application to ROWs to encourage native plant growth that can outcompete weeds or other undesirable vegetation in the ROW.

BMP Maintenance During Site Work

1. **Application of Herbicides, Pesticides, or Fertilizers in ROWs:**

   - Conduct spray applications on ROW according to specific label directions and applicable local and state regulations.
     - Do not apply herbicides, pesticides, or fertilizers if it is raining or immediately before storm events.
     - Ensure that the pesticide application equipment is capable of immediate shutoff in the event of an emergency.
     - Do not apply pesticides within 100 feet of surface waters such as lakes, ponds, wetlands, streams, and any stormwater conveyance ditches unless the application

is approved and permitted by the Washington State Department of Ecology (see Figure 2).

- Never apply herbicides, pesticides, or fertilizers in quantities that exceed the manufacturer's instructions.

- Mix herbicides, pesticides, or fertilizers and clean the application equipment under cover from precipitation in an area where accidental spills will not enter surface water, groundwater, or soil.

Figure 2. Example of marked pesticide barrier.

- Do not hose down paved areas used to mix herbicides, pesticides, or fertilizers and clean application equipment.

- Carefully follow the manufacturer's directions when cleaning containers or equipment used for pesticide applications. Ensure that all application equipment is triple rinsed and that all rinse water is captured by the sanitary sewer system.

Site Cleanup

1. **Herbicides and Pesticides:**

   - Dispose of all herbicide and pesticide containers only after careful cleaning and rinsing. Also ensure that all herbicide and pesticide contaminated materials are appropriately disposed of in a hazardous waste facility.

2. **Drain Covers:**

   - Remove vegetation and any sediment or dirt buildup on top of and adjacent to the storm drain inlet by hand sweeping.

   - Remove drain cover.

3. **Waste Disposal:**

   - Remove and dispose of accumulated solid waste at authorized disposal areas.

   - Label waste containers and place them in a covered area. Keep lids closed at all times.

4. **Cleaning and Repair of Tools and Equipment:**

   - Use non-toxic solvents whenever possible if solvents are necessary.
   - Use phosphate-free detergents when practical.
   - Use drip pans under equipment when maintaining, repairing, and servicing in the field.
   - Clean tools in a designated warehouse or work area and ensure washwater drainage is routed to the sanitary sewer.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	**King County Surface Water Design Manual (King County 2016)**	**Stormwater Pollution Prevention Manual (King County 2016)**
1.110 – Vegetation (Mowing) 1.111 – Vegetation (Equipment/Tools Cleanup and Maintenance) 2.79 – Inlet Protection	C.3.7 – Vegetated Strip C.3.9 – Storm Drain Inlet Protection	Chapter 3 – Nonstructural Source Control BMPs A-26 – BMPs for Landscaping and Vegetation Management

Landscape Maintenance and Vegetation Disposal

This section contains several SOPs covering the following activities:

- General landscape maintenance
- Tree pit maintenance
- Install/plant
- Pruning
- Tree watering
- Tree removal
- Irrigation
- Clean and repair equipment and tools

General Landscape Maintenance

Description of Work

Crews responsible for landscape maintenance (separate from ditch maintenance and roadside ditch maintenance) complete a variety of activities: mowing, watering, weed control, litter pick-up, leaf pick-up, and tree maintenance.

Objectives

Implement proper landscaping and erosion control techniques to prevent plant material and sediment from entering drainage systems. Use proper fertilizer and herbicide application techniques to minimize contamination of stormwater and only if other alternatives would not achieve desired results. Utilize alternatives to pesticides when possible.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Mower (including a specialized mower for steep slopes)
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Brush cutters
- ❑ Power saws
- ❑ Axes and/or machetes
- ❑ Pruning shears, loppers, and/or clippers
- ❑ Truck cover (for securing load during transport)
- ❑ Seed mix and hydroseeder (for minor reseeding/replanting)
- ❑ Post-seeding erosion control BMPs (e.g., straw mulch, biodegradable nets and blankets, coir mats)
- ❑ Weeding tools, weed burner, and/or weed wrench
- ❑ Targeted herbicide applicator (woody painter/herbicide wand)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets

Work Planning

Each of these activities requires that the current and near-term weather conditions be considered when planning work. Chemical applications require close attention to labeling to prevent unintended movement of chemicals over or through the soil.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Sensitive Area Considerations:** Minimize work and machinery in environmentally critical sensitive areas to what is necessary. Stabilize soils as necessary.

3. **Activities Requiring the Use of Pesticides or Fertilizers:** Refer to the *Fertilizer, Pesticide, and Herbicide Application SOP*.

4. **Mulching:** Use appropriate mulch materials and application rates.

BMP Maintenance During Site Work

1. **Activities Requiring the Use of Pesticides or Fertilizers:** Refer to the *Fertilizer, Pesticide, and Herbicide Application SOP*.

2. **Activities Not Requiring the Use of Pesticides or Fertilizers:**

   - **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

     - Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric, or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

     - Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than one day) that impact a series of catch basins adjacent to the work site.

       - Place the appropriate size filter sock in the catch basin or storm drain inlet.

- Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
- Trim and remove filter sock material that extends beyond the grate.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (Figure 4).
- **Cleaning and Repair of Tools and Equipment:**
  - Use non-toxic solvents whenever possible if solvents are necessary.
  - Use phosphate-free detergents when practical.
  - Use drip pans (see Figure 5) under equipment when maintaining, repairing, or servicing in the field.
- **Hand Watering:**
  - Do not leave manual surface watering devices unattended without an automatic timer.
  - Ensure that water delivery does not exceed the soil's current capacity to absorb water (do not allow runoff from the site)

Figure 5. Example of drip pan used for equipment maintenance.

Figure 2. Catch basin filter sock

Figure 3. Water-filled barrier dam and straw wattles used for containment.

Figure 4. Raking debris out of surface runoff channel.

- When possible, use tree watering bags to apply water over a long period of time.
- Allow for a schedule that accommodates slow water delivery resulting in deep water penetration.

- **Mowing:**
  - Pick up and properly contain all litter at the mow site prior to mowing to prevent mulching of debris into the turf.
  - Strategize mowing direction to minimize to the maximum extent feasible the spreading of cut material onto adjacent paved surfaces.
  - Use mulching blade kits to recycle grass back into the landscape.
  - Quickly remove cuttings from paved surfaces before moving to the next mow location.
- **Leaf Pick Up:**
  - Schedule the work as early as possible in the fall, preferably before the seasonal rainfall peaks.
  - Take the time to locate drain covers that may be buried in the leaf material prior to start of work.
  - Remove litter from leaf piles to the greatest extent feasible prior to initiating work.
- **Mulching:**
  - Mulch when needed (see Figure 6).
  - Increase mulch thicknesses for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.
  - Check mulched areas periodically, especially following severe storms. Repair damaged areas of mulch or tie-down material.
- **Grass Seeding:** Seed as necessary. Place jute mat or similar cover on steep slopes.

Figure 6. Mulching (SDOT).

Site Cleanup

1. **Pesticides/Noxious Weed Removal:** Dispose of all pesticide containers only after careful cleaning and rinsing, and ensure that all pesticide contaminated materials are appropriately disposed of in the hazardous waste facility.

2. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.

3. **Catch Basin Filter Socks:**

    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.

    - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.

    - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).

4. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

5. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels and/or handheld blowers appropriate for the site.

6. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse. Chip tree limbs and store in mulch pile for reuse.

7. **Litter Pick Up:** Ensure that all litter is collected in the appropriate containers and secured for safe transport to the transfer facility.

8. **Waste Disposal:**

    - Remove and dispose of accumulated solid waste at authorized disposal areas.

    - Label waste containers and place them in a covered area. Keep lids closed at all times.

9. **Cleaning and Repair of Tools and Equipment:**

    - Collect and properly manage (recycle or dispose of) used materials such as grease, oil, oil filters, antifreeze, cleaning solutions, lead-acid batteries, hydraulic and transmission fluids, and tires.
    - Dispose of these wastes at recycling facilities; municipal solid waste disposal facilities; hazardous waste treatment, storage, and disposal (TSD) facilities; or the sanitary sewer as required.
    - Salvage and recycle any useful materials.

10. **Documentation:**

    - Record maintenance activities.
    - Keep records for at least five years.
    - Submit records to Ecology upon request.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	**King County Surface Water Design Manual (King County 2016)**	**Stormwater Pollution Prevention Manual (King County 2016)**
1.110 – Vegetation (Mowing) 1.111 – Vegetation (Equipment/Tools Cleanup and Maintenance) 2.79 – Inlet Protection	C.3.3 – Nets and Blankets C.3.7 – Vegetated Strip C.3.9 – Storm Drain Inlet Protection D.2.1.2.6 – Temporary and Permanent Seeding	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Tree Pit Maintenance

Description of Work

Maintenance of tree pit for pedestrian safety issues. Can include mulching for leveling purposes, adjusting or removing grates and pavers.

Objectives

Implement proper landscaping techniques to prevent soil, mulching materials, and plant material from entering the separate storm drain system.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers, catch basin filter socks, and/or water-filled barrier dams
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Wheelbarrow or buckets
- ❑ Mulch
- ❑ Truck cover (for securing load during transport)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)

Work Planning

Where feasible, avoid tree pit maintenance when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlet:

    - Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

- Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than one day) that impact a series of catch basins adjacent to the work site.
    - Place the appropriate size filter sock in the catch basin or storm drain inlet.
    - Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
    - Trim and remove filter sock material that extends beyond the grate.

Figure 1. Drain cover.

Figure 2. Catch basin filter sock.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch, or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (see Figure 4).

BMP Maintenance During Site Work

Refer to Figure 5a-b for examples of crews at work on a tree pit maintenance project.

1. **Drain Covers:** Inspect and adjust periodically to ensure that the cover is effective. Consider adding a larger cover, additional covers or weighted materials to increase effectiveness as needed.
2. **Catch Basin Filter Socks:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

Figure 3. Water-filled barrier dam and straw wattles used for containment.

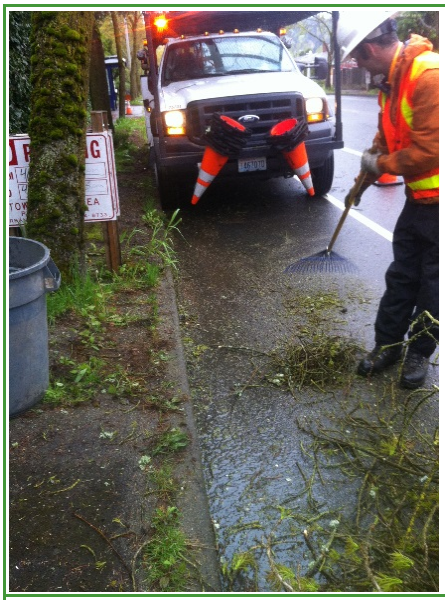

Figure 4. Raking debris out of surface runoff channel.

Figure 5a-b. Tree pit maintenance activities (SDOT).

3. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

4. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 6).

Figure 6. Hand sweeping of vegetation waste (SDOT).

5. **Mulching:**

   - Increase mulch thicknesses for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

   - Check mulched areas periodically, especially following severe storms. Repair damaged areas of mulch or tie-down material (see Figure 7).

Site Cleanup

1. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.
2. **Catch Basin Filter Socks:**
   - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.
   - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.
   - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).
3. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

Figure 7. Mulching (SDOT).

4. **Debris Control:** Ensure all mulch, soil, vegetative matter, or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels, and/or handheld blowers appropriate for the site.
5. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.79 – Inlet Protection	C-3.2 – Mulching C.3.9 – Storm Drain Inlet Protection	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Install/Plant

Description of Work

Planting a tree or installing a new irrigation system. Use when planting annuals, shrubs, bulbs, or perennials, and/or when installing a new irrigation system.

Objectives

Properly manage soil, mulch, and sod to minimize stormwater pollution.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers, catch basin filter socks, and/or water-filled barrier dams
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Wheelbarrow or buckets
- ❑ Truck cover (for securing load during transport)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)

Work Planning

Consider the following worksite conditions when planning tree planting or irrigation installation projects as ground disturbance is common to this activity:

- Slopes; precipitation forecast; and presence or absence of natural controls such as curbs, sod or other impediments to soil movement.

- Allow adequate time to protect disturbed soils as necessary for multi-day projects.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

- Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

- Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than 1 day) that impact a series of catch basins adjacent to the work site.
    - Place the appropriate size filter sock in the catch basin or storm drain inlet.
    - Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
    - Trim and remove filter sock material that extends beyond the grate.

Figure 2. Catch basin filter sock.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch, or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (see Figure 4).

Figure 3. Water-filled barrier dam and straw wattles used for containment.

BMP Maintenance During Site Work

Refer to Figure 5a-b for examples of crews at work on planting projects.

Figure 4. Raking debris out of surface runoff channel.

Figure 5a-b. Planting activities (SDOT).

1. **Drain Covers:** Inspect and adjust periodically to ensure that the cover is effective. Consider adding a larger cover, additional covers or weighted materials to increase effectiveness as needed.

2. **Catch Basin Filter Socks:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

3. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

4. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 6).

5. **Mulching:**

    - Increase mulch thicknesses for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

    - Check mulched areas periodically, especially following severe storms. Repair damaged areas of mulch or tie-down material (see Figure 7).

Site Cleanup

1. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.

2. **Catch Basin Filter Socks:**

   - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.

   - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.

   - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).

3. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

4. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels, and/or handheld blowers appropriate for the site.

5. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse. Chip tree limbs and store in mulch pile for reuse.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	**King County Surface Water Design Manual (King County 2016)**	**Stormwater Pollution Prevention Manual (King County 2016)**
2.79 – Inlet Protection	C.3.9 – Storm Drain Inlet Protection	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Pruning

Description of Work

Pruning of trees and tree roots to prevent overcrowding and/or encroachment into infrastructure.

Objectives

Reduce stormwater contamination from soil erosion and tree debris.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers, catch basin filter socks, and/or water-filled barrier dams
- ❑ Mower (including a specialized mower for steep slopes)
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Brush cutters
- ❑ Power saws
- ❑ Axes and/or machetes
- ❑ Pruning shears, loppers, and/or clippers
- ❑ Truck cover (for securing load during transport)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Tree climbing gear
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets

Work Planning

Where feasible, avoid tree and tree root pruning when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

- Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric, or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

- Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than 1 day) that impact a series of catch basins adjacent to the work site.
    - Place the appropriate size filter sock in the catch basin or storm drain inlet.
    - Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
    - Trim and remove filter sock material that extends beyond the grate.

Figure 2. Catch basin filter sock.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (see Figure 4).

Figure 3. Water-filled barrier dam and straw wattles used for containment.

BMP Maintenance During Site Work

Refer to Figure 5a-b for examples of crews at work on tree and root pruning activities.

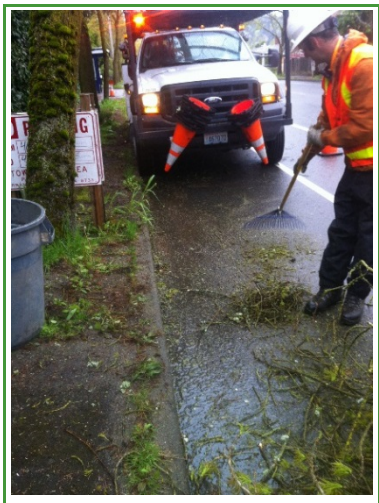

Figure 4. Raking debris out of surface runoff channel.

Figure 5a-b: Tree pruning activities (SDOT)

3. **Drain Covers:** Inspect and adjust periodically to ensure that the cover is effective. Consider adding a larger cover, additional covers, or weighted materials to increase effectiveness as needed.

4. **Catch Basin Filter Socks:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

5. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

6. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 6).

Figure 6. Hand sweeping of vegetation waste (SDOT).

7. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

8. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 6).

Site Cleanup

1. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.

2. **Catch Basin Filter Socks:**

    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.

    - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.

    - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).

3. **Water-filled Barrier D`ams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

4. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels, and/or handheld blowers appropriate for the site.

5. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.79 – Inlet Protection	C.3.9 – Storm Drain Inlet Protection	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Tree Watering

Description of Work

Filling water bags or soil injection for trees.

Objectives

Reduce stormwater contamination from soil erosion and tree debris.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Water bag
- ❑ Water
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)

Work Planning

No recommendations.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Water Bag:** Install water bag (see Figure 1) by zipping the bag around the tree and filling it with water.

Figure 1. Water bag used for tree irrigation containment.

BMP Maintenance During Site Work

Ensure that water is not overflowing from water bag and creating soil erosion issues.

Site Cleanup

Remove water bag once tree has been established and water bag is no longer necessary for irrigation.

References

Stormwater Pollution Prevention Manual (King County 2016)
Chapter 3 – Nonstructural Source Control BMPs A-26 – BMPs for Landscaping and Vegetation Management

Tree Removal

Description of Work

Removal, cleanup, or making street trees safe for the public using ropes, chainsaws, chippers, dump trucks, and aerial lifts.

Objectives

Reduce stormwater contamination from soil erosion and tree debris.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers, catch basin filter socks, and/or water-filled barrier dams
- ❑ Straw wattles and/or silt fence
- ❑ Mulch
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Brush cutters
- ❑ Ropes, power saws, chippers, dump trunks and/or aerial lifts
- ❑ Axes and/or machetes
- ❑ Pruning shears, loppers, and/or clippers
- ❑ Truck cover (for securing load during transport)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets

Work Planning

Where feasible, avoid tree removal work when rain is falling or expected.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

- Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

- Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than 1 day) that impact a series of catch basins adjacent to the work site.
    - Place the appropriate size filter sock in the catch basin or storm drain inlet.
    - Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
    - Trim and remove filter sock material that extends beyond the grate.

Figure 2. Catch basin filter sock.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (see Figure 4).

Figure 3. Water-filled barrier dam and straw wattles used for containment.

3. **Erosion Control:** Consider implementing erosion control if a project involves steep slopes or multiple tree removals in one location that could result in destabilization of the soil either as a result of the actual work being done, or the loss of tree cover in the area. Erosion control can include the following BMPs:

- **Straw Wattles:**
  - Install straw wattles (see Figure 5) if warranted by the size of the project, if the project will last multiple days, or if the project is located adjacent to sensitive areas.
  - Use straw wattles as a check dam in ditches, for drop inlet protection, as a temporary interceptor dike and swale, or for perimeter sediment control.
  - Silt fences, coir logs, or other BMPs may be more appropriate depending on the size and location of the project.

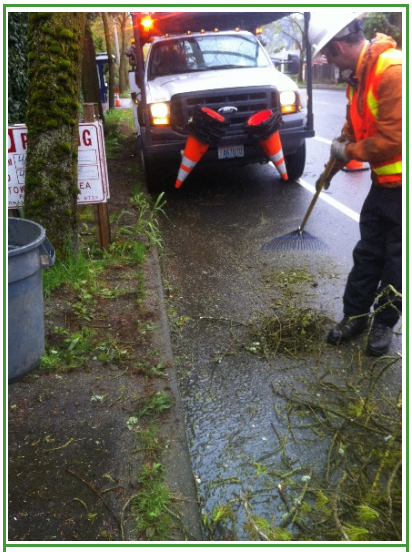

Figure 4. Raking debris out of surface runoff channel.

- **Silt Fence:**
  - Install a silt fence adjacent to the roadway if there are sensitive areas nearby (e.g., wetlands or streams) that must be protected during the work.
  - Place the silt fence along contours and securely anchor the bottom of the fabric for its entire length to reduce undermining (see Figure 6).
  - Ensure that the height of the fence is adequate to reduce the potential for silt leaving the work site.
  - Ensure that there is at least a 3-foot overlap at vertical seams to avoid leakage and that both ends of the overlap are securely attached to posts.
  - Increase the elevation at the ends of the silt fence installation to prevent "end runs."

Figure 5. Straw wattle used for erosion control.

Figure 6. Silt fence used for erosion control.

BMP Maintenance During Site Work

Refer to Figure 7a-b for examples of crews at work on a tree removal projects.

Figure 7a-b. Tree removal activities (SDOT).

1. **Tree Removal:**

   - Use selective (rather than wholesale) removal of trees to conserve soil and reduce wood wastes. Avoid indiscriminate removal of trees and other beneficial vegetation.

   - Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. **Drain Covers:** Inspect and adjust periodically to ensure that the cover is effective. Consider adding a larger cover, additional covers or weighted materials to increase effectiveness as needed.

3. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

4. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 8).

5. **Mulching:**

Figure 8. Hand sweeping of vegetation waste (SDOT).

- Mulch when needed (see Figure 9).
- Increase mulch thicknesses for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.
- Check mulched areas periodically, especially following severe storms. Repair damaged areas of mulch or tie-down material.

Figure 9. Mulching (SDOT).

6. **Sweeping:**
   - May be necessary for large projects next to paved surfaces, particularly in landslide-response tree removals.
   - Control the number of points where vehicles can leave the site to allow focused sweeping and vacuuming efforts.
   - Do not sweep up any unknown substance or any object that may be potentially hazardous.
   - Inspect potential sediment tracking locations daily after initiating sweeping to ensure that sweeping is being implemented effectively.
   - Perform equipment and vehicle maintenance in areas that prevent discharges to the storm drain system.
   - Prevent sediment from entering storm drain system.
7. **Erosion Control:**
   - Continually monitor operations and installed BMPs to determine if erodible soils, stockpiles, or sediment laden stormwater could enter the stormwater system or a water body. If observations indicate offsite migration of erodible soils or sediment laden stormwater could occur, repair existing BMPs or implement additional BMPs to contain soils and sediment laden stormwater onsite. If this does not resolve the issue(s), stop operations and immediately implement preventative measures such as berms, barriers, secondary containment, and vactor trucks.
   - Remove sediment around straw wattles and silt fences when deposits reach one-half the height of the BMP.

Site Cleanup

1. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.

2. **Catch Basin Filter Socks:**

    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.

    - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.

    - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).

3. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

4. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels and/or handheld blowers appropriate for the site.

5. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse.

6. **Sweeping:**

    - Clean equipment and tools offsite in an area where pollutants can be contained.

    - Properly dispose of sweeper waste at an approved dump site after sweeping is finished.

7. **Erosion Control:**

    - Evaluate the site to determine if erosion control BMPs are no longer needed (i.e., the area has stabilized and the potential of sediment laden water exiting the area has passed).

    - Remove sediment buildup in front of erosion control BMP before removing BMP.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.31 – Coir Log 2.79 – Inlet Protection	C.3.6 – Silt Fence C.3.9 – Storm Drain Inlet Protection D.2.1.2.5 – Straw Wattles	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Irrigation

Description of Work

Testing, troubleshooting, maintaining, repairing, upgrading and winterizing above and below ground irrigation systems. Involves trenching by hand and with equipment, spot excavations, watering timing adjustments, and water evacuation using compressed air.

Objectives

Implement proper excavation and water delivery techniques to prevent soil, contaminated water, mulching materials, and plant material from entering the separate storm drain system.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Drain covers, catch basin filter socks, and/or water-filled barrier dams
- ❑ Straw wattles and/or silt fence
- ❑ Mulch
- ❑ Brooms, scoops, shovels, hoes, handheld blowers, and/or rakes
- ❑ Brush cutters
- ❑ Truck cover (for securing load during transport)
- ❑ Garbage bags (to prevent seed development and dispersal)
- ❑ Protective clothing and eye protection (for toxic, noxious weeds)
- ❑ Wheelbarrow or buckets

Work Planning

Be familiar with the entire system before beginning work. Know the extent of the system and how it operates before excavation or adjustment. Be aware of predicted weather patterns so that equipment and staff can be prepared to install a variety of BMPs as the situation warrants.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Physical Protection Measures to Consider:** Use any or all of the following best management practices (BMPs) if there is a potential for vegetation or sediment to enter any catch basin or storm drain inlets:

- Install **drain covers** on any drain structures located downslope or adjacent to the work area. **Drain covers** may be wood, fabric or metal as long as it functions appropriately for the site conditions (see Figure 1). They may be manufactured specifically for the purpose of covering drains or consist of a multi-purpose tool found at the work site.

Figure 1. Drain cover.

- Install **catch basin filter socks** (see Figure 2) if it is impossible to prevent sediment from travelling downstream during the duration of the project. Also consider installing **catch basin filter socks** for long duration projects (more than 1 day) that impact a series of catch basins adjacent to the work site.
    - Place the appropriate size filter sock in the catch basin or storm drain inlet.
    - Place the storm drain or catch basin grate on top of the filter sock to hold it in place.
    - Trim and remove filter sock material that extends beyond the grate.

Figure 2. Catch basin filter sock.

- Install **water-filled barrier dams** (see Figure 3) upstream of work sites during periods of heavy rainfall to divert surface runoff around the worksite to prevent the movement of soil, mulch, or other materials off site. Consider weather forecast to ensure the BMP is installed prior to heavy rainfall if necessary.
- **Debris Control:** Move debris out of surface runoff channels during periods of heavy rainfall to prevent the movement of debris downstream (see Figure 4).

Figure 3. Water-filled barrier dam and straw wattles used for containment.

3. **Erosion Control:** Consider implementing erosion control if a project involves steep slopes or installation or removal of an irrigation system that could result in destabilization of the soil. Erosion control can include the following BMPs:

Figure 4. Raking debris out of surface runoff channel.

- **Straw Wattles:**
    - Install straw wattles (see Figure 5) if warranted by the size of the project, if the project will last multiple days, or if the project is located adjacent to sensitive areas.
    - Use straw wattles as a check dam in ditches, for drop inlet protection, as a temporary interceptor dike and swale, or for perimeter sediment control.
    - Silt fences, coir logs, or other BMPs may be more appropriate depending on the size and location of the project.

Figure 5. Straw wattle used for erosion control.

- **Silt Fence:**
    - Install a silt fence adjacent to the roadway if there are sensitive areas nearby (e.g., wetlands or streams) that must be protected during the work.
    - Place the silt fence along contours and securely anchor the bottom of the fabric for its entire length to reduce undermining (see Figure 6).

Figure 6. Silt fence used for erosion control.

    - Ensure that the height of the fence is adequate to reduce the potential for silt leaving the work site.
    - Ensure that there is at least a 3-foot overlap at vertical seams to avoid leakage and that both ends of the overlap are securely attached to posts.
    - Increase the elevation at the ends of the silt fence installation to prevent "end runs."

BMP Maintenance During Site Work

Refer to Figure 7a-b for examples of crews at work on an irrigation upgrade project.

Figure 7a-b. Irrigation upgrade (SDOT).

1. **Drain Covers:** Inspect and adjust periodically to ensure that the cover is effective. Consider adding a larger cover, additional covers or weighted materials to increase effectiveness as needed.

2. **Catch Basin Filter Socks:** Clean or remove and replace filter sock when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

3. **Water-filled Barrier Dams:** Inspect regularly especially during periods of heavy rainfall to ensure effectiveness. Consider adding multiple dams for larger worksites or as conditions warrant.

4. **Debris Control:** Periodically sweep up and remove debris from road surface to ensure debris does not get kicked or moved into moving water (see Figure 8).

Figure 8. Hand sweeping of vegetation waste (SDOT).

5. **Erosion Control:**

    - Continually monitor operations and installed BMPs to determine if erodible soils, stockpiles, or sediment laden stormwater could enter the stormwater system or a water body. If observations

indicate offsite migration of erodible soils or sediment laden stormwater could occur, repair existing BMPs or implement additional BMPs to contain soils and sediment laden stormwater onsite. If this does not resolve the issue(s), stop operations and immediately implement preventative measures such as berms, barriers, secondary containment, and vactor trucks.

- Remove sediment around straw wattles and silt fences when deposits reach one-half the height of the BMP.

6. **Recommendations for Specific Activities:**

   - **Testing and Troubleshooting:**

     - Make sure that you are ready to quickly respond to large water flows if leaks are suspected in the system. If possible, predict the water flows and protect the storm drains closest to the affected areas.

     - Use at least a two-person team when troubleshooting to minimize the time necessary to isolate leaks.

     - Turn active systems to "off" if leaks are not repaired by the end of a shift.

   - **Upgrading and Repairing:**

     - Whenever possible, keep excavated soil out of the paved street surface; cover any soil or trench when left unattended.

     - If using an airspade, use vertical barriers to prevent soil from drifting out of the worksite.

     - Use mulch with or without grass seed to prevent erosion after backfilling (see Figure 9).

   - **Winterizing:** Monitor drain locations to ensure any water exiting the system is not contributing to erosion. If necessary, install proactive BMPs as outlined above to direct water away from areas where it could contribute to erosion or transport sediment.

Figure 9. Mulching (SDOT).

Site Cleanup

1. **Drain Covers:** Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping. Remove drain covers.

2. **Catch Basin Filter Socks:**

    - Remove sediment buildup in front of the catch basin or storm drain inlets by hand sweeping.

    - Remove the filter sock and dispose of the collected sediment in a suitable container to be hauled offsite.

    - Reuse the filter sock at another site if it remains in good condition (e.g., no rips, tears, or visible staining).

3. **Water-filled Barrier Dams:** Remove any accumulated sediment behind dam and properly dispose. Deflate dam and store for reuse.

4. **Debris Control:** Ensure all mulch, soil, vegetative matter or other debris is cleaned off of road surface prior to departure. Use brooms, scoops, shovels, and/or handheld blowers appropriate for the site.

5. **Vegetation Disposal:** Cover and secure load when transporting grass clippings, leaves, sticks, and other collected vegetation back to the yard. Place collected vegetation in the appropriate piles at the yard for disposal or reuse.

6. **Erosion Control:**

    - Evaluate the site to determine if erosion control BMPs are no longer needed (i.e., the area has stabilized and the potential of sediment laden water exiting the area has passed).

    - Remove sediment buildup in front of erosion control BMP before removing BMP.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	King County Surface Water Design Manual (King County 2016)	Stormwater Pollution Prevention Manual (King County 2016)
2.31 – Coir Log 2.79 – Inlet Protection	C.3.6 – Silt Fence C.3.9 – Storm Drain Inlet Protection D.2.1.2.5 – Straw Wattles Reference 4-C – Landscape Management Plan Guidelines	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-26 – BMPs for Landscaping and Vegetation Management Disposal Information Sheet

Clean and Repair Equipment and Tools

Description of Work

Cleaning and minor maintenance of equipment performed by field personnel including the repair of small tools and washing vehicles.

Objectives

Use proper techniques for equipment maintenance, service, and repair operations to reduce the potential for discharge of pollutants to watercourses or streams.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Broom and/or mop
- ❑ Drip pans
- ❑ Tools
- ❑ Non-toxic solvents and/or phosphate-free detergents
- ❑ Protective clothing and eye protection

Work Planning

Where feasible, avoid equipment cleaning and repair outside when rain is falling or expected. If applicable, ensure you have an appropriate designated pressuring washing area.

Site Preparation

1. **Spill Kit:** Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

BMP Maintenance During Site Work

1. **Washwater:**

    - Discharge all washwater to a sanitary sewer, process treatment system, or holding tank and not to the stormwater drainage system. If a holding tank is used for the storage of washwater, the contents must be pumped out before the tank is full and then discharged into the sanitary sewer or wastewater treatment system.

- Conduct pressure washing in a designated area (such as a wash pad) that is provided with a sump drain connected to the sanitary sewer system, a treatment system, or a holding tank. Prevent stormwater run-on using a berm or sump.
- Prohibit discharge of any wastewaters to stormwater drains.
- Minimize water and detergent use in all washing operations.

2. **Equipment and Tool Repairs:**

- Use non-toxic solvents whenever possible if solvents are necessary.
- Use phosphate-free detergents when practical.
- Perform vehicle and equipment maintenance, repair, and service at designated repair facilities whenever possible.
- Routinely inspect equipment, tools, and vehicles for leaks or damage.
- Promptly repair or replace leaking connections, pipes, hoses, and valves.
- Do not pour material down drains or hose down work areas.
- Use either dry sweeping or damp mopping.
- Remove buildup of oils and grease on equipment.
- Perform equipment maintenance in areas that prevent discharges to the storm drain system.
- Use drip pans (see Figure 1) under equipment when maintaining, repairing, or servicing in the field.
- Clean surfaces following any discharge or spill incident.

Figure 1. Example of drip pan used for equipment maintenance.

Site Cleanup

1. **Waste Disposal:**

    - Collect and properly manage (recycle or dispose of) used materials such as grease, oil, oil filters, antifreeze, cleaning solutions, lead-acid batteries, hydraulic and transmission fluids, and tires.

    - Dispose of these wastes at recycling facilities; municipal solid waste disposal facilities; hazardous waste treatment, storage, and disposal facilities; or the sanitary sewer as required.

    - Salvage and recycle any useful materials.

References

Regional Road Maintenance Endangered Species Act Program Guidelines (Regional Road Maintenance Technical Working Group 2002)	**Stormwater Pollution Prevention Manual (King County 2016)**
1.111 – Vegetation (Equipment/Tools Cleanup and Maintenance)	Chapter 3 – Nonstructural Source Control BMPs A-11 – Cleaning or Washing of Tools and Equipment A-15 – Pressure Washing of Buildings, Rooftops, and Other Large Objects A-18 – Vehicle and Equipment Repair and Maintenance Disposal Information Sheet

Trash and Pet Waste Management

Description of Work

Pick up litter and pet waste and dispose properly.

Objectives

Prevent pet waste from washing into rivers and streams where it may cause low oxygen levels, ammonia release, nutrients that encourage weed and algae growth, and bacteria that cold lead to recreational closures.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Brooms
- ❑ Bags, buckets and containers for litter and pet waste

Work Planning

1. Inspect and clean outdoor areas where there may be litter and pet waste prior to rain events.

2. Check City-owned trash cans and pet waste stations on a regular basis to keep bag dispensers stocked and waste cans empty. Keep regular trash out of pet waste cans to avoid filling them too quickly. Make sure pet waste disposal stations have a cover to keep out water.

3. Do not place pet waste in yard waste containers because pet waste may carry diseases, and yard waste treatment may not kill disease organisms.

Site Preparation

Not applicable

BMP Maintenance During Site Work

1. **Litter Pick Up:** Pick up litter by hand and by sweeping. Collect in appropriate containers.

2. **Pet Waste Pick Up:** Scoop, sweep, and clean up pet waste deposited on sidewalks, place in securely closed bag and deposit it in the trash.

Site Cleanup

1. **Litter and Pet Waste Disposal:** Ensure that all litter and pet waste is secured for safe transport to the transfer facility.

References

Stormwater Management Manual for Western Washington (Ecology 2019)
Volume IV, S440 – BMPs for Pet Waste

Building Exterior Cleaning and Maintenance

Description of Work

Maintenance, repair, and upkeep of all City-owned buildings, yards, and transfer sites including offices, shops, and storage yards.

Objectives

Prevent washwater from cleaning activities that can contain suspended solids, soaps, and detergents from entering rivers and streams.

BMP Equipment Checklist

- ❑ Spill kit
- ❑ Sweeper
- ❑ Pressure washer
- ❑ Washwater collection system

Work Planning

Minimize the use of water and detergents in washing operations when practicable.

Site Preparation

1. **Spill Kit**: Keep a spill cleanup kit in a nearby vehicle or next to the work site so that it is easily accessible. Make sure the contents of the spill kit are appropriate for the types and quantities of materials used for this work task. Refill spill kit materials before beginning work.

2. **Prior to Cleaning Parking Lots/Yards:** Sweep surfaces prior to cleaning/washing to remove excess sediment and other pollutants.

3. **Prior to Washing Buildings:** Block or disconnect all rooftop downspouts when washing roofs.

BMP Maintenance During Site Work

1. **Washing Buildings:**

    - Collect the washwater from building structures and convey it to appropriate treatment such as a sanitary sewer system if it contains oils, soaps, or detergents.

- If the washwater does not contain oils, soaps, or detergents (in this case only a low pressure, clean, cold water rinse is allowed) then it could drain to soils that have sufficient natural attenuation capacity for dust and sediment.

- If the surface being pressure washed is painted with lead or other heavy metal–bearing paint (such as chromium or cadmium), use a commercial pressure washing service that will collect, test, and properly dispose of the wastewater.

Site Cleanup

1. **Washwater Disposal:**

    - Ensure that washwater is disposed of properly as described under BMP Maintenance During Site Work.

References

Stormwater Management Manual for Western Washington (Ecology 2019)	**Stormwater Pollution Prevention Manual (King County 2016)**
Volume IV, S431 – BMPs for Washing and Steam Cleaning Vehicles/Equipment/Building Structures	A-15 – Pressure Washing of Buildings, Rooftops, and other Large Objects

REFERENCES

Ecology. 2019. Draft Stormwater Management Manual for Western Washington. Prepared by the Washington State Department of Ecology.

King County. 2016. Surface Water Design Manual. Prepared by the King County Department of Natural Resources and Parks. April.

King County. 2016. Stormwater Pollution Prevention Manual: Best Management Practices for Commercial, Multi-Family and Residential Properties. April.

King County and Herrera. 2019. Field Guide to Roadside Ditch Maintenance in Western Washington. February.

Regional Road Maintenance Technical Working Group. 2002. Regional Road Maintenance Endangered Species Act Program Guidelines.